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Veterinary PracticeToday
THE JOURNAL FOR PERSONAL & PROFESSIONAL DEVELOPMENT

Antibiotic resistance

What's the problem?

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The obvious and the not-so-obvious

Stress
Understanding the components of stress

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UP FRONT...

Working together for the care we all want

In the BBC Reith Lectures, broadcast in December last year, Dr Atul Gawande, a practising surgeon and professor at both the Harvard School of Public Health and Harvard Medical School, gave a series of four lectures on the subject of 'The Future of Medicine'.

In the second of these, entitled 'The Century of the System', he described how one of his colleagues had observed, "we are graduating from the century of the molecule to the century of the system". What he meant was that we've gained an enormous amount in the last century – by focusing on reducing problems to their atomic particles, discovering the gene that underlies disease, or the neuron that underlies the way our brain works, or the 'super specialist' who can deliver on a specific corner of knowledge.

What we are discovering now, however, is that as we graduate into the future, we are faced with a world where it's *how the genes connect together* that actually determines what our diseases actually do. It's *how the neurons connect together* and form networks that create consciousness and behaviour, and it's *how* the drugs and the devices and the *specialists all work together* that actually creates the care that we want. And that when they don't fit together, care falls apart.

This is a message that is as applicable to the veterinary profession as to our human medical colleagues. In fact it is an encouragement for us all to work more closely together.

In this edition of *Veterinary Practice Today*, Helen Ballantyne – who is both a registered 'human' and veterinary nurse – turns traditional thinking on its head as she begins to investigate what human nurses might learn from the veterinary nursing profession. Communication is high on her list.

Senior vet nurse, Nicola Ackerman, who is a member of the Veterinary Products Committee, rides above the 'blame game' to suggest that it is only by working together that human medical staff and veterinary professionals can effectively tackle the growing problem of antibiotic resistance.

In the Reith Lecture, Dr Gawande emphasised the necessity of looking outside traditional spheres of expertise to tackle problems. He described how he worked with a team from the airline industry to design a checklist to reduce deaths from surgery – a checklist that was made specifically to catch the kinds of mistakes that even experts, such as airline pilots, will make. Most often these were basically failures in communication.

And just for the record, in every hospital that used the checklist, the experts found that their complication rates fell – the average was 35 per cent and the average reduction in deaths was 47 per cent.

David Watson
Editor

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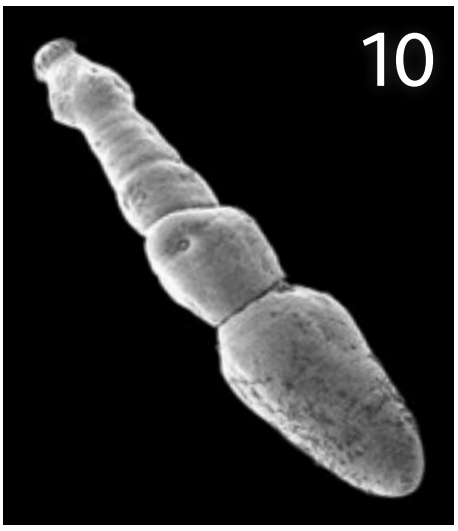

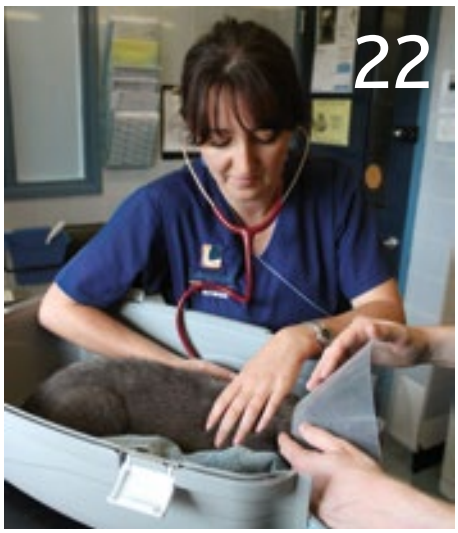

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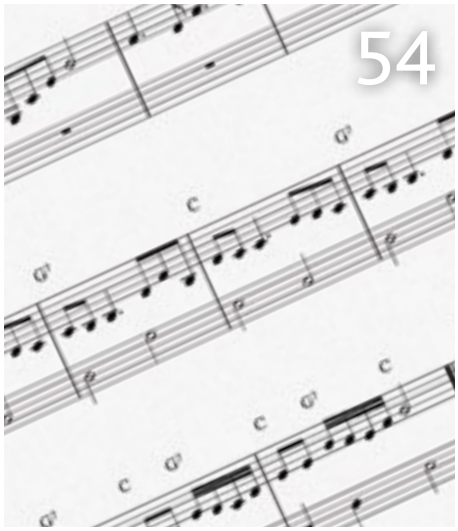

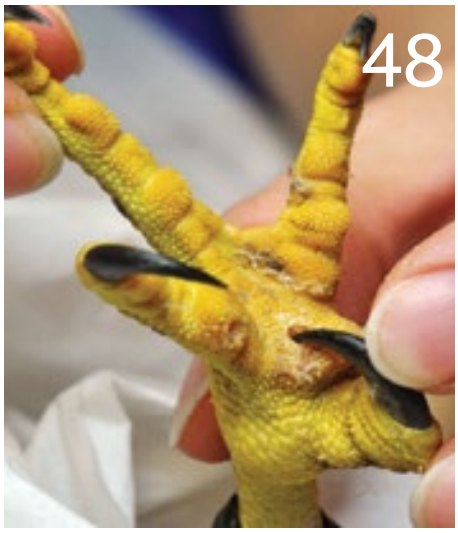

Management

Industry

Featured contributors

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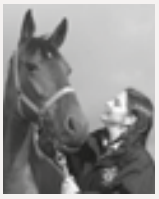
David qualified from the Royal Veterinary College in 2003 and worked in mixed and small animal practice for the next four years. Between 2007 and 2010 he was a resident in Veterinary Oncology at the University of Liverpool and then returned to the RVC to study for a PhD identifying novel targets for anti-cancer immunotherapy. David is an RCVS and European specialist in veterinary oncology. In 2014, David was appointed senior lecturer in Veterinary Oncology at the University of Liverpool.



Imogen Johns
BVSc Dip ACVIM FHEA MRCVS

Imogen graduated from the University of Sydney in 1997, and then spent three years in equine practice in Australia. She completed a residency in Large Animal Internal Medicine at the University of Pennsylvania between 2001 and 2003, and lectured there until 2007. She is currently a senior lecturer in Equine Medicine at the RVC. Her major clinical interests are in gastrointestinal diseases of horses and foals.

Joe Henry
BVMS Cert SHP MRCVS

Joe Henry graduated from Glasgow Veterinary School in 1998. He moved into a mixed practice in Alnwick and soon became predominantly a sheep and beef vet with a particular interest in disease prevention and health planning. He was made a partner in 2005 and is now based in Rothbury where his day-to-day work is helping reduce the impact of disease on the sheep and beef farms in the surrounding area. Joe passed the Certificate in Sheep Health and Production in 2011.

Helen Ballantyne
BSc(Hons) PGDip RN RVN

After graduating with a Degree in Pharmacology in 2002, Helen qualified as a RVN in 2005 and has been on the BVNA Council for three years. In September 2013 she qualified as a 'human' nurse from Sheffield Hallam University and currently works in the critical care unit at Papworth Hospital, the UK's largest specialist cardiothoracic centre. She remains a registered veterinary nurse, working shifts in emergency and critical care to keep her skills and knowledge up to date.

Antibiotic resistance: what's the problem?

Nicola Ackerman
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Nicola works as the senior medical nurse at The Veterinary Hospital in Plymouth. She graduated from Hartpury College with an Honours Degree in Equine Science, and subsequently qualified as a veterinary nurse in 2002. Nicola has been an officer of the BVNA and past editor of the Veterinary Nursing Journal. She sits on the Veterinary Products Committee for the Veterinary Medicines Directive, and has written for many veterinary publications and textbooks. Nicola won the BVNA/Blue Cross Award for Animal Welfare in 2010, and various SQP awards in 2011, 2012, 2013 and 2014.

Antibiotic resistance is the ability of a micro-organism to withstand the effects of an antibiotic, and is a specific type of drug resistance. Antibiotic resistance evolves naturally via natural selection through random mutation, but it could also be engineered by applying an evolutionary stress on a population through poor infection control, global trade and through the misuse of antimicrobials.

Antibiotic resistance is a natural phenomenon. When an antibiotic is used, bacteria that can resist that antibiotic have a greater chance of survival than those that are 'susceptible'. Susceptible bacteria are killed or inhibited by an antibiotic, resulting in a selective pressure for the survival of resistant strains.

Antibiotic resistance in bacteria spreads at three levels by:
- transfer of bacteria between people and/or animals
- transfer of resistance genes between bacteria (usually on plasmids)
- transfer of resistance genes between genetic elements within bacteria, on transposons

ANTIBIOTICS

Understanding the mechanisms involved in resistance to antibiotics is of importance both for the responsible use of antibiotics in practice, and for the development of new antibacterial drugs to circumvent resistance (Rang et al, 2003) (**Figure 1 & 2**).

Figure 1. *Selective pressure on a population, causing resistance.*

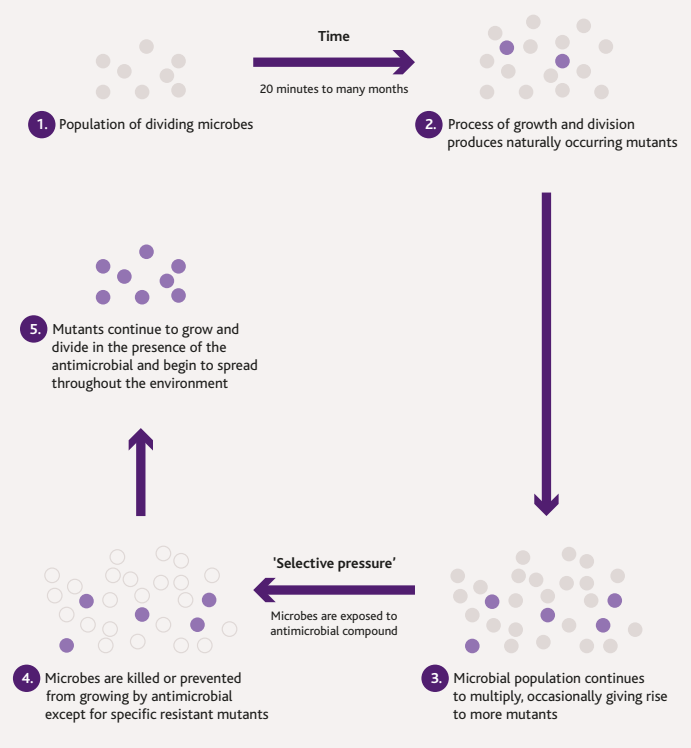
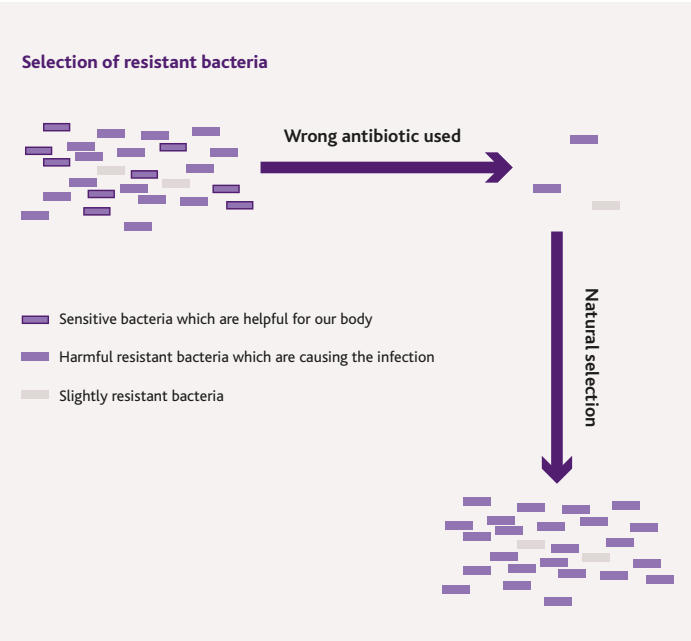


Figure 2. *How using the wrong antibiotic can cause antibiotic resistance.*



Critically important antibiotics (CIA)

Three key groups of antibiotics – fluoroquinolones, 3rd and 4th generation cephalosporins, and macrolides have been classified as CIAs for human health by the World Health Organisation (WHO). They are also classified as critically important from a veterinary perspective by the World Organisation for Animal Health (OIE).

There are situations where the bacteria causing disease are resistant to other groups of antibiotics and a veterinary surgeon may need to prescribe a CIA to ensure that the animal(s) is/are treated effectively. Less than 15 per cent of the antibiotics sold for veterinary use in the UK in 2011 were those identified by the WHO as critically important for human medicine.

The UK position on the use of CIAs by the veterinary sector remains that these antibiotics should be reserved for clinical conditions which respond poorly to other classes of antibiotics, and where antibiotic sensitivity testing has been carried out.

Discussions with clients on the importance of using the correct antibiotic in order to treat their animal is vital. There is always a cost implication in these matters, but the cost of one culture and sensitivity test could, potentially, be less than a course of the incorrect antibiotics.

Biosecurity

The importance of disease prevention in the initial use of antimicrobials – and, therefore, reducing resistance from occurring – is of great importance in the veterinary practice. It has always been thought that veterinary nurses (VNs) are best placed in this role of biosecurity and they should be given responsibility for the biosecurity procedures within veterinary practices.

Biosecurity protocols are required under the RCVS Practice Standards Scheme (PSS) and attendance at a CPD training event on biosecurity should be included. Dissemination of this knowledge throughout the practice is vital, and evidence that this has occurred should be documented.

The importance of infection control procedures should not be underestimated. Cleaning protocols for all areas of the practice need to be set out, alongside cleaning schedules. Additional guidance should be in place for infectious and zoonotic diseases.

Differences in dilution rates for cleaning products need to be closely followed and correctly measured out. All organic material should be removed prior to the disinfection of floors and surfaces. It is also recommended that all fomites (mop, mop bucket, brooms) are regularly cleaned and disinfected (**Figure 3**).

Figure 3. *Methods of increasing biosecurity in veterinary practice.*

- Hand washing, alcohol gels (clients and staff)
- Uniforms only to be worn within the practice
- Ensure that all fomites (mops, buckets, brooms) are cleaned regularly
- Veterinary vehicles that go on to farms should be kept clean, especially when going from farm to farm

Bacterial resistance to disinfectants can develop in the same manner as antibiotic resistance. Correct dilution rates are, therefore, equally important as antibiotic dose rates in order to prevent selective pressure for resistance.

Contraction in use of antibiotics

In order to reduce antibiotic resistance, a first step is to reduce their use; thus reducing the likelihood of resistance from occurring. There are many factors that can contribute to achieving this and they include:

- Vaccination – it should become the norm that all dogs are vaccinated against all preventable diseases, such as distemper and kennel cough. Across all species, annual outbreaks of the disease can be avoided if there is good 'herd' coverage
- Keeping the animal healthy through good nutrition and husbandry. So, for instance, reduction of flies will reduce the incidence of 'summer mastitis' resulting from bacterial transference. Good nutrition aids in keeping the animal healthy by means of a good immune response
- Quarantine protocols, for all animals entering an environment – farm and kennels, for instance

Reduce and refine

Public Health England released figures in October 2014 looking at antibiotic usage in human medicine. It revealed the following statistics:

- 6% increase in prescriptions between 2010 and 2013
- Rise from 25.9 to 27.4 doses per 1,000 people per day
- Doctors in Merseyside are prescribing 30.4 defined daily doses per 1,000 people compared with just 22.8 in the Thames Valley region
- Link between areas of high prescribing and resistant bacteria
- 12% increase in the number of resistant *E. coli* infections in the blood

These figures proved to be quite disappointing – especially as there has been a drive on the reduction in use of antibiotics within the NHS – and one of the subsequent recommendations is that antimicrobial use for prophylactic purposes in veterinary medicine should be reduced/removed. This has occurred already in some EU member countries.

The definitions of prophylaxis and metaphylaxis are different in the two sectors, and we need to be looking at reserving the use of antibiotics for curative and control treatments.

Curative treatment (also referred to as therapy)

This can be defined as the treatment of a sick animal – or group of animals – following the diagnosis of infection and/or clinical disease.

Control treatment (sometimes referred to in veterinary medicine as metaphylaxis)

This is the approach that is mostly equivalent to prophylaxis in human medicine.

It covers treatment of a group of animals after the diagnosis of infection and/or clinical disease in part of the group, with the aim of preventing the spread of infectious disease to animals in close contact and at considerable risk, and which may already be infected subclinically.

A useful comparison with human medicines would be where a child in a classroom is diagnosed with meningococcal meningitis necessitating urgent treatment of all other in-contact children.

Preventive treatment (sometimes referred to as prophylaxis)

This refers to treatment of an animal or a group of animals, before clinical signs of infectious disease appear, in order to prevent the occurrence of disease or infection.

It is vital that the correct antibiotic is used ('refined') under any given circumstances, so the use of broad-spectrum antibiotics for all cases is not advocated (BSAVA, 2014). Selection of the antibacterial must be made in parallel with culture and sensitivity testing of the bacterial growth. Specificity is key in the reduction of resistance.

Compliance

Compliance is important in preventing antibiotic resistance

There are many areas that can be utilised to aid in compliance including the use of posters in waiting rooms, smartphone apps to remind clients to 'tablet' their pet, and online videos showing how to medicate animals. The palatability of medications and their size/ease of administration are vital in aiding the proper medication of animals. New innovative methods of administration really do help clients with compliance.

Monitoring resistance

Lack of efficacy of medications of any type should be reported to the Veterinary Medicines Directorate (VMD) under the auspices of pharmacovigilance. This includes resistance to antibiotics, anthelmintics and lack of efficacy when using vaccines. Reporting of lack of efficacy can be completed via the VMD website, so that figures can be collated for the UK Veterinary Antibiotic Resistance and Sales Surveillance (UK-VARSS) Report (VMD, 2014).

BSAVA PROTECT

The British Small Animal Veterinary Association (BSAVA) has developed the PROTECT policy in order to reduce antibiotic resistance. The acronym PROTECT stands for:

- Practice policy?
- Reduce prophylactic use
- Other options for treatment?
- Types of drugs and bacteria?
- Employing the correct antibacterial?
- Cytology and culture
- Treating effectively

Each of these elements should be utilised in order to aid in resistance. PROTECT posters can be displayed to offer guidance in the correct use of antibiotics for specific indications. The website is a valuable resource for all veterinary practice staff.

Client education

Education of pet owners and farmers is vital in the reduction of antibiotic resistance. Veterinary surgeons need to be discussing with owners why a culture of the infection is advantageous, rather than just prescribing another course of antibiotics.

Owners need guidance on compliance, and why it is important. VNs are still being under-utilised in this role, and they should be given every opportunity to discuss methods of medicating pets, husbandry and nutrition with clients so that they are aware of their role in reducing the development of antibiotic resistance.

Conclusion

There is a strong possibility that there will be tighter controls on the prescribing and use of antibiotics in all sectors of medicine – both human and veterinary. Veterinary professionals need to be on board with the recommendations being made by various veterinary associations with respect to antibiotic use in order to safeguard their continued usage in veterinary medicine, especially set against a background of animal welfare considerations.

Initiatives such as the Antibiotic Guardian project, antibioticguardian.com, are an excellent way in which we can engage professionals and the general public alike. ■

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Ian is regularly published in peer-review journals and carries out research into companion animal parasites, including work on intestinal nematodes and tick-borne diseases.

**Suggested Personal & Professional Development (PPD)*

PARASITOLOGY

Diagnosis and significance of common cestodes in UK cats and dogs

Despite the widespread availability of anthelmintics effective against them, tapeworms (Class Cestoda) are still common parasites of UK cats and dogs. This represents a failure of control on the part of veterinary professionals and pet owners; but the question arises, 'Does this unchecked infection with cestodes in our pets matter?' This article reviews the epidemiology of tapeworm infections endemic in the UK, the zoonotic risk they represent and their diagnosis, treatment and control.

Although this group of endoparasites rarely causes disease in the definitive host, infection in pets often leads to revulsion and distress in pet owners and some species have zoonotic potential. The most serious of these zoonotic threats in the UK is from *Echinococcus granulosus* which persists in endemic foci despite repeated campaigns to eliminate it.

Tapeworms of veterinary importance in UK cats and dogs are taeniids and have a complex life cycle, requiring an intermediate host. The adult tapeworm is always found in the intestine and attaches to the intestinal wall using a scolex (head) armed with an array of attachment devices, including hooks and/or suckers. Despite the physical attachment of the worms to the intestinal wall, significant pathology and clinical signs in cats and dogs is rare and even large worm burdens are well tolerated.

Eggs or proglottid segments containing eggs are passed in the faeces and ingested by the intermediate host. This leads to cyst formation in the tissues which are then infective to the definitive host via scavenging, grooming or predation.

Taenia spp.

A number of species are present in the UK and summarised in **Table 1**.

Adult tapeworms of all species are large and can grow up to 500cm in length. Cats and dogs become infected through ingestion of tissue cysts in ruminants, rabbits or rodents. This can occur through scavenging or hunting. Although *Taenia* spp. are well tolerated – even if high worm burdens are present – they do have veterinary significance.

Proglottid segments in the faeces can cause revulsion and affect the pet/owner bond. Heavier burdens of the larger tapeworms can also lead to weight loss, polyphagia – and rarely – obstruction. The greatest concern from these tapeworms, however, is the significant number of sheep carcasses condemned because of the presence of *Taenia ovis* cysts, which is a significant cause of economic loss to UK farmers each year.

Taenia spp. are ubiquitous throughout the UK, with dogs – and especially cats – being infected through scavenging and predation. Feeding of offal and under-cooked meat is still a common practice in working dogs, also exposing them to infection.

All of these factors increase the risk of exposure during the spring and summer months; this risk is increased during

Table 1. *Taenia* spp. found in UK cats and dogs

Taenia spp.	Definitive host	Intermediate host	Stage and location in intermediate host
Taenia pisiformis	Fox and dog	Rabbit	*Cysticercus pisiformis* in abdomen or liver
Taenia hydatigena	Fox and dog	Cattle and sheep	*Cysticercus tenuicollis* in abdomen or liver
Taenia multiceps	Dog	Sheep and cattle	*Coenurus cerebralis* in brain and spinal cord
Taenia ovis	Fox and dog	Sheep and goats	*Cysticercus ovis* in muscle
Taenia serialis	Dog	Rabbit	*Coenurus serialis* connective tissue
Taenia taeniaeformis	Cats	Rodents	*Cysticercus fasciolaris* in liver

Table 2. Classification of sub-species of *Echinococcus granulosus*

Name	Definitive host	Intermediate host	Zoonotic	Present in UK
E. granulosus sensu stricto	Dog	Sheep, buffalo	Yes (most zoonotic)	Yes
E. equinus	Dog	Horses	No	Yes
E. artleppi	Dog	Cattle	Yes	Yes
E. canadensis	Dog, wolves	Camels, cervids, pigs	Yes	Yes
E. felidis	Lion, hyena	Warthogs	Unknown	No

the hunting/shooting seasons for dogs working as pack or gun dogs.

Echinococcus granulosus

The classification of *Echinococcus granulosus*, the cause of cystic echinococcosis (hydatid disease), has undergone many changes; but the current broadly accepted classification is summarised in **Table 2**.

Adult tapeworms are small at five to six millimetres long (**Figure 1**) with hydatid cysts that are then evident in intermediate hosts, including ruminants, equines, pigs and man.

These cysts can lead to condemnation of offal in food-producing animals; but, more seriously, can lead to significant pathology in man with cysts forming in the bone, liver, central nervous system and heart. Ingestion of the cysts by canids occurs mostly through scavenging of carcasses or feeding of offal.

Endemic foci of *E. granulosus* remain in the UK despite extensive attempts at control. Herefordshire, Mid Wales and the Western Isles of Scotland have the highest prevalence and the remote nature of some of these locations can make the clearance of potentially infected carcasses very difficult.

Dipylidium caninum

This is the most common tapeworm in UK cats and dogs. Adult tapeworms are up to 50cm in length (**Figure 2**) and fleas, such as *Ctenocephalides felis* (**Figure 3**) and lice, such as *Felicola subrostratus* (**Figure 4**) act as intermediate hosts.

Dogs, and more commonly cats, become infected by ingesting fleas and lice through grooming or ingestion of infested prey species. Veterinary professionals must remember that *D. caninum* is a potential zoonosis, as well as *E. granulosus*.

In the case of *D. caninum*, humans act as the definitive host with adult worms in the small intestine. While infection in people is rare and the pathogenicity low, there can be significant emotional distress associated with tapeworm infection. Cases have been reported in most countries including Poland (Szwaja et al, 2011) and Japan (Tsumura et al, 2007) in recent years and there is potential for cases in the UK to occur without adequate precautions.

Response to treatment with praziquantel in human cases is excellent; but zoonotic infection can be avoided with good hygiene and adequate flea control. Pet owners may, understandably, exhibit revulsion by often very active proglottid segments emerging from their pets or being found free in the environment, even though these pose no direct zoonotic risk.

D. caninum is present throughout the UK and infection is most commonly seen when flea control programmes fail or are absent. Feral cats or cats spending a great deal of time outdoors (the author knows many cat owners who own very personable cats but rarely see them!) however, may still become infected in the face of adequate flea control. This is because cats are fastidious groomers and will rapidly consume some of the fleas with which they come into contact when outdoors.

Although lice also act as intermediate hosts for *D. caninum*, they add little to the distribution of the parasite as lice often co-infest hosts with fleas and they are uncommon where sufficient flea control measures are in place.

Diagnosis

Diagnostic techniques in cats and dogs differ between *E. granulosus* and other tapeworm infections found in the UK.

Taenia spp. and *D. caninum*

Infection is often detected by the presence of proglottid segments either in the faeces or around the perineum. *D. caninum* proglottids are more elongated and active than those of *Taenia* spp.

Examination with a hand lens will also reveal the presence of double genital organs in *D. caninum* proglottids. If the segments are broken up with a needle in water and examined under the microscope, *D. caninum* egg packets will be seen, where *Taenia* spp. proglottids will contain numerous single eggs.

Although proglottids may break up naturally in the faeces leading to egg packets and eggs being present, they are not commonly seen on faecal flotation tests and this is a relatively insensitive method of diagnosis (Wolfe et al, 2001).

E. granulosus

The Gold Standard for diagnosis in canids remains examination of the intestines at necropsy by sieving intestinal contents, scraping the intestinal wall and then examination for the adult parasites (Deplazes and Eckert, 1996). This is a highly sensitive and specific technique in experienced hands, but it has many drawbacks.

Figure 1. *Adult Echinococcus tapeworm (Photo: Bayer).*

Figure 2*. Dipylidium caninum (Photo: Bayer).*

It is expensive and carries the high potential of zoonotic risk and so requires extensive safety precautions. Although it remains of vital importance in establishing epidemiological patterns of spread for the parasite, it is of no use in assessing risk in an individual pet dog.

Infections in dogs are subclinical, proglottids are almost never seen in the faeces and ova detection in faeces by faecal flotation is insensitive (Wolfe et al, 2001). Even if eggs are seen, the eggs are typically taeniid in appearance (**Figure 5**) and cannot be differentiated visibly from *Taenia* spp. eggs. These difficulties in diagnosis have led to the development of coproantigen ELISA and PCR testing to increase sensitivity.

Christofi et al (2002) found ELISA coproantigen testing to have a sensitivity of 83 per cent and a specificity of 98 per cent, dropping to 80 per cent when *Taenia* spp. infection was also present. PCR antigen testing of faeces also has a high specificity (>99%) and high sensitivity on tissues; although sensitivity drops to as low as 40 per cent when testing raw faeces. It is also expensive and labour intensive; yet has some potential for screening programmes in the future (Abbassi et al, 2003).

The difficulty of diagnosing infection routinely in the live patient makes prophylactic therapy the safest option in endemic areas and taeniid eggs found in the faeces of dogs from these areas should be assumed to be *E. granulosus* infection.

Figure 5. *Taenia spp. egg.*

Treatment and control

All tapeworms of veterinary significance are exquisitely sensitive to praziquantel and this remains the treatment of choice in cats and dogs. A dose of 5mg per kg orally in cats and dogs or 8mg per kg as a spot-on solution in cats is sufficient to eliminate infection.

Where dogs are suspected to be infected with *Echinococcus* spp., it is advisable that they are treated under the supervision of a veterinarian and that the dogs are shampooed to remove any parasite eggs on the coat. It has been demonstrated that many types of ova will adhere to dogs' coats without visible faecal contamination needing to be present (Wolfe and Wright, 2003; Wolfe and Wright, 2004). Fenbendazole at 50mg/kg orally is also effective at treating *Taenia* spp. infections in cats and dogs and has some limited efficacy against *D. caninum*.

Praziquantel can be given in formulations on its own but is also found in combination with a variety of other drugs to treat roundworms, allowing integration tapeworm treatment and control with that of other endoparasites, such as *Toxocara* spp. and *Angiostrongylus vasorum*.

Tapeworm control consists of a number of elements.

Chemical prophylaxis

Taenia spp. have a prepatent period of four to 10 weeks; *E. granulosus* six to eight weeks; *D. caninum* three weeks. This only occurs under optimum conditions of humidity and temperature and so use of a product containing praziquantel monthly should be sufficient to eliminate proglottid and ova shedding.

Figure 3. *Adult cat flea.*

Figure 4. *Cat biting louse, Felicola subrostratus.*

Although resistance to praziquantel is not recognised in tapeworm infections of companion animals as a consequence of reservoirs of infection in wildlife, feral cats, foxes and intermediate hosts, resistance is still an ongoing possibility. So monthly prophylaxis should, therefore, only be used where there is significant zoonotic risk, high challenge or failure of other control aspects.

Avoiding ingestion of infective stages

This involves the prevention of carcass scavenging, avoiding feeding raw offal and under-cooked meat, as well as preventing hunting of wild rodents and birds. While it is desirable to eliminate these activities where possible, this can be difficult or impossible in some working dogs and outdoor cats. In these situations, chemical prophylaxis becomes essential.

Conversely, indoor cats and dogs not exposed to these potential sources of infection do not require chemical prophylaxis.

Flea and louse control

Flea and louse prophylaxis forms an important part of *D. caninum* control. This may be effective as a sole control measure in dogs and outdoor cats, but is unlikely to be sufficient alone in outdoor cats that will groom off fleas with which they come into contact. Even in these pets, however, adequate flea control should be sufficient to prevent zoonotic transmission.

Picking up faeces

This will help to reduce exposure of livestock to *Taenia ovis* and *E. granulosus* eggs. Preventing pet and stray dogs from gaining access to pasture will also help to reduce faecal contamination.

While these methods may fail to suppress *D. caninum* and *Taenia* spp. completely, proglottid and ova production owing to issues of compliance, pet life style or heavy flea and louse challenge, this is rarely required. Reducing numbers will improve animal health and proglottids will be seen less frequently – if at all – by owners.

E. granulosus eradication, however, is highly desirable and the parasite's continued presence in the UK presents a significant zoonotic health risk. The prepatent period of *E. granulosus* is six to eight weeks and so transmission to canids – and, therefore, eradication – should be achievable by treatment with praziquantel at least every six weeks, together with the prevention of access to offal and carcasses from cattle and sheep.

There have been numerous attempts to achieve this and

eradicate the parasite from the UK. Between 1974 and 1983, there were two cases of human hydatid disease in Wales and 0.2 cases per million in the rest of the UK.

A voluntary control programme of supervised free praziquantel dosing of dogs in Wales reduced this incidence and this was replaced by a health education programme in 1990. However, this relaxation of the rules and an increase of carcass availability in the 2001 foot-and-mouth epidemic allowed some re-emergence of the disease, and prevalence of *E. granulosus* in Welsh dogs rose from 3.4 per cent in 1993 to 8.1 per cent in 2002 (Buishi et al, 2005).

Since then, the annual number of cases of human hydatid disease in the UK has remained fairly constant with 12 cases in 2011. The Welsh Assembly continues to raise public awareness of the disease, promotes praziquantel worming programmes in dogs and points to the identification of hydatid cysts in cattle in England, suggesting that this is not a uniquely Welsh problem, but rather that vigilance is required across the country.

Zoonotic transmission of *E. granulosus* and *D. caninum* can also be reduced by good hygiene. It should be emphasised to clients that this is not only for obvious faecal contamination, but also after contact with pets and before eating. This is to prevent the transfer of ova attached to the coat that subsequently contaminate hands, and also flea and louse body parts that can be trapped under the fingernails and then be ingested.

Conclusions

Tapeworms are common parasites of UK cats and dogs and have economic significance in livestock production, as well as causing concern in pet owners and having zoonotic potential.

It is the role of veterinary professionals to place these risks in perspective for clients and put their minds at rest, while also assessing risk and putting effective treatment and control programmes in place where required. This can often be done as part of an integrated parasite control programme. ■

PPD Questions

1. Which of the following tapeworms have proglottids containing egg packets?

   A. *Echinococcus granulosus*
   B. *Taenia ovis*
   C. *Taenia multiceps*
   D. *Dipylidium caninum*

2. Which of the following adult tapeworms is less than 1cm long?

   A. *Echinococcus granulosus*
   B. *Taenia ovis*
   C. *Taenia multiceps*
   D. *Dipylidium caninum*

3. As well as fleas, what can act as an intermediate host for *D. caninum*?

   A. Harvest mites
   B. Biting flies
   C. Lice
   D. Mites

4. What is the oral dose of praziquantel for tapeworm treatment in dogs and cats?
   A. 2mg/kg
   B. 5mg/kg
   C. 10mg/kg
   D. 20mg/kg

Answers
1.D 2.A 3.C 4.B

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Helen Ballantyne
BSc(Hons) PGDip RN RVN

After graduating with a Degree in Pharmacology in 2002, Helen qualified as a RVN in 2005 and has worked in a variety of settings nationally and internationally. She has been on the BVNA Council for three years and is currently editor-in-chief for the Veterinary Nursing Journal.

In September 2013, she qualified as a 'human' nurse from Sheffield Hallam University and currently works in the Critical Care Unit at Papworth Hospital, the UK's largest specialist cardiothoracic centre.

Helen remains a registered veterinary nurse, working shifts in emergency and critical care to keep her skills and knowledge up to date. She has developed a strong interest in the idea of sharing medicine, applying concepts used by medical staff to the veterinary profession and vice versa. Her friends and family take great delight in asking her, as she goes to work, "Is it humans or animals today?'

**Suggested Personal & Professional Development (PPD)*

NURSING

A foot in both camps: shared perspectives in human and veterinary nursing

Once a week, on average, I am asked why I swapped from veterinary nursing to 'human' nursing. I have my reply well-rehearsed. "It's complex," I say. "I wanted more opportunity to specialise, to learn, more career progression. And over and above those factors, it was a vocation. I wanted to help people. It was – and it is – that simple."

As I moved through various veterinary nursing roles, I found myself drawn to helping the owner just as much as I was compelled to nurse my patient. It surprised me, it crept up on me almost subconsciously; and suddenly it was the only thing that I wanted to do. It's the best decision I have ever made.

It has taken some work – returning to university for two years after being in full-time employment takes its toll. While my friends are investing in ISAs and putting deposits down on their new houses, I'm just starting to re-build my well-depleted savings. It's been worth it, however. Not only do I have a satisfying and fascinating career but working as a 'human' nurse has proved to me just how important veterinary nursing is.

Shared bond

The human-animal bond is something that many people have studied; so to some the family pet is a part of the family, to others a pet may be their 'family'. Nowadays, very often, a pet is a 'conversation starter' for me, a way to start a therapeutic relationship. I work in intensive care and we encourage family and friends to bring in photos of the patient's 'nearest and dearest'.

Time and time again, alongside wedding photos, graduation photos and baby photos, there is Spot, Douglas, Daisy or Rover, the family cat, dog or chicken held in as high esteem as the other snapshots of life before admission to critical care.

Patients wake from long surgeries, are extubated and then ask how their dog is; videos are played, and instructions for care sent via the bedside nurse as a short stay becomes a longer one. As I care for patients whose animals are central to their lives, I feel a greater and greater pride in the work I did before; pride for a profession that I am watching move from strength to strength.

Almost daily, I remember some aspect of my previous role that has crept into my current role. Sometimes it is obvious and humorous – such as when I refer to the family of my patient as owners. Or the other habit I can't seem to shake, "I've left the checklist on the kennel," as kennel and bed become interchangeable. Both comments raise a few laughs from colleagues in the know, while to those oblivious to my past, it has caused confusion at best, concern at worst!

I am constantly on the lookout for key evidence, skills or equipment that may be useful to veterinary nursing. VNs in practice often ask me questions about my role. They ask about nursing care plans, they wonder about the theatre routine and cleaning, and there is also the occasional question about end of life care. Just last week a VN friend and I discussed - over dinner - the merits of faecal catheters, wondering if their use could be extrapolated to veterinary nursing.

Reversed roles

Recently I was asked to look at my role upside down, back to front and round the wrong way. For the past three years I have always tried to gather information that we could use in the veterinary world, now someone sharp was asking me to turn it on its head. What could human nurses learn from veterinary nurses?

It's a challenging idea. Most of us know and understand that modern advances in veterinary medicine are often borrowed or adapted from human medical disciplines. Indeed, I presume it is that which fuels the outside interest in my career change. When I look at veterinary nursing specifically, there are key parallels. Just as care bundles, care plans and professional responsibility have come to veterinary nursing, human nursing has also been through the same transition.

So, reflecting on the development of human nursing into a profession in its own right, leads me to one of the first aspects of veterinary

"The average VN has a much greater understanding of the pressures and role of the veterinary surgeon than the average human nurse has of the doctor"

nursing that could be extrapolated to human nurses – good communication.

Historically, we know that human nurses had a very different role ... 'No matter how gifted she may be, she will never become a reliable nurse until she can obey without question. The first and most helpful criticism I ever received from a doctor was when he told me I was supposed to be simply an intelligent machine for the purpose of carrying out his orders.' (Dock, 1917).

As I look at human and veterinary nurses today, I can see that, overall, gone are the days where we were expected to follow orders blindly. More often than not, people nursing all species are expected to assess their patients, then plan, carry out and evaluate the care given. Additionally, in many instances, this may happen before a patient has even seen a doctor or vet.

Specifically, as veterinary nursing moves into the realms of 'registered' professionalism and we take responsibility for our actions, so it is likely there will be more debate and discussion at the 'kennel side' as we work with our colleagues as part of an ever-expanding multi-disciplinary team.

VNs lead on communication

Robinson et al (2010) tell us that nurse-doctor communication affects patient safety. Their study into nurse-physician communication goes on to conclude that there needs to be a mutual respect and an authentic understanding of each other's roles. With that in mind, I would argue that my professional relationships with the vets with whom I have worked have become effective quicker and more easily than similar interactions with the doctors on my unit.

Within veterinary practices, there tends to be a much more informal, friendly form of communication. First names are used and social chit-chat is common across the theatre or wards. Geography plays a key role too – vets and VNs are often in close proximity to each other, a theatre vet can pop their head around the door of the recovery area and check on how things are going. That vet will then return to the room next door, so that the same informal communication can be reciprocated should the VN need advice about the patient.

Additionally, I would argue that the average VN has a much greater understanding of the pressures and role of the veterinary surgeon than the average human nurse has of the doctor. VNs will often book appointments, theatre lists, help with consultations and, therefore, are aware of the totality of the tasks at hand.

In human nursing, a formality – for better or worse, I'm not yet sure – remains. Very often the consultant may be distant from the ward; and certainly the knowledge of the role of the surgeon – beyond that of the actual surgery – is limited.

Senior nurses usually have closer relationships with doctors; however, the specialist nature of nursing within the health service means that a recovery nurse may not understand the role of the surgeon, just as a theatre nurse may not understand what calls the ward doctors away. Throw in the fact that no one seems to be too keen on GPs and it can be a bit of bunfight.

Don't get me wrong. Once in place, the working relationships that I have witnessed are strong and safe; but, in my opinion, it takes us longer to get there.

Some of the reasons for this lack of awareness of the roles of others are obvious – geography, as I've mentioned; and formality, fear, timing and specialism, all contribute. However, it is clear to me that as I get to know and understand the role of the doctors on my unit, I am able to communicate much more clearly with them. I also understand when it is good to contact them, and when it is not.

"Working as a 'human' nurse has proved to me just how important veterinary nursing is"

In 2011, the Patient and Health Service Ombudsman told us that poor communication is one of the most common causes for dissatisfaction with the National Health Service (NHS). While that is not necessarily linked to interactions between nurse and doctor, it is surely part of the bigger picture. If a majority of medical errors or complaints – possibly with an associated financial settlement – can be traced back to poor communication; so taking the time to improve core communication skills may save money and more importantly may prevent mistakes.

It is a piece of work from which the NHS, in my opinion, could benefit. Indeed, this year's National Patient Safety Goals, as developed by the Joint Commission, listed, 'Improvement in communication between care givers' as a primary goal to prevent patient errors.

Cost consciousness

It is impossible to write an article that mentions nursing in the NHS without mentioning money and finances. It affects us daily – from '1% pay rise' fights on BBC Radio 4, to caring for immigrants, to waste within hospitals. We are constantly exposed to headlines and media reports. Here we see a direct contrast between human and veterinary nurses.

Veterinary nurses know and understand how much things cost – they are often

"Veterinary nurses know and understand how much things cost"

in charge of stock monitoring and ordering and are usually involved in billing clients for their services. Human nurses on the front line do not often engage with costs.

To be clear, the NHS must always be free at the point of entry. Aneurin Bevan was right and the NHS is an institution that should be nurtured and invested in. It is the envy of the world, and rightly so.

However, I can't help wondering if patients, nurses and doctors were more like veterinary nurses and understood what things cost, would it help?

I notice that in many NHS wards, labels have appeared in stock cupboards to try and let people know how much the disposable equipment costs. But, as we don't bill them, don't have to pay for them, do we really think about it? The cupboards fill themselves, something runs out and we make a call and it is replaced. I am sure that senior nurses spend their days grappling with budgets and costs, but on the floor, dressings are dropped and binned, linen remains piled up at bedsides to be re-laundered when that patient leaves, despite its not being used.

In a recent editorial, Ruth Oshikanlu (2013) a health visitor in London, wrote, 'I realised the importance of recording for financial reasons when I worked in a private hospital. All the equipment used was coded so that the client could be charged appropriately'. Could working as vet nurses do, keeping a note of what has been used, limit waste and make human nurses think a little more about the equipment they take off the shelf? If they had to charge each item to a client, would it make them more careful?

Additionally, there is scope for the public to understand more. Recently a Department of Health-funded report estimated that there is over £90 million worth of unused prescription medicines retained in individual's homes at any one time in the UK. I wonder if those people knew how much those medicines cost, would their conscience let them take another pack "just in case"? If medical teams knew that, would they routinely send patients home with prescriptions?

Shared horizons

I continue to reflect on how much more vet nursing and human nursing can learn from each other. I hope that there will be many more opportunities for the two worlds to join as the notion of comparative learning takes a foothold in veterinary CPD across the country. Clinically and non-clinically, we can learn from each other.

I wonder if paediatrics might lend us more equipment ideas, whether CPD ideas can be shared, and would community nursing help those VNs who work in outreach projects across the UK? Would human nurses be able to communicate with their medical colleagues more efficiently if they understood their role? Should human nurses be more like vet nurses when it comes to resources?

I am not sure of the answers, but I know that I will continue to keep my 'veterinary nursing brain'. It is the animals I am often thinking about when I learn a new skill, hear a new piece of evidence, or learn how to use a new piece of equipment.

My patient – human or animal – will always be my priority; but it seems you can take the veterinary nurse out of practice, but you can't take veterinary practice out of the veterinary nurse. So, I know that as long as I can, I shall maintain my RVN status, because nursing – people or animals – is a privilege, and I'm not ready to give up the opportunity to do either. ■

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David qualified from the Royal Veterinary College in 2003. He worked in mixed and then small animal practice for the next four years. Between 2007 and 2010, he was a resident in veterinary oncology at the University of Liverpool. After his residency he returned to the RVC to study for a PhD identifying novel targets for anti-cancer immunotherapy.

David was awarded the Royal College of Veterinary Surgeons Certificate in Small Animal Medicine in 2008 and the European College of Veterinary Internal Medicine Diploma in Veterinary Oncology in 2011. He is an RCVS and European Specialist in Veterinary Oncology; and in 2014 he was appointed senior lecturer in veterinary oncology at the University of Liverpool.

**Suggested Personal & Professional Development (PPD)*

MELANOMA

Canine melanocytic tumours and malignant melanoma

Melanocytic tumours arise from melanocytes and include both malignant melanoma and more benign variants (often referred to as melanocytomas).

Melanocytes contain melanosomes that produce melanin via the action of a number of melanosomal glycoproteins, such as tyrosinase. Melanocytomas and malignant melanomas (MM) are common tumours in dogs; arising on haired skin, in the oral cavity (COMM), on the digits (CDMM) and, more rarely, at the limbus (CLMM) or uvea (CUMM) – the latter not being discussed here owing to space constraints.

Their behaviour is variable. Oral and digital melanomas are frequently aggressive locally and highly metastatic; by comparison, the behaviour of cutaneous melanocytic tumours can be quite variable with some lesions benign and others being highly aggressive.

Prevalence and presentation
Melanocytic tumours are generally seen in older dogs – in one large study those bearing melanocytoma had a mean age of 8.8 years and those with MM 11 years (Gillard et al, 2013). Reports vary, but there does not appear to be a substantive predisposition based upon sex (Gillard et al, 2013).

The greater prevalence of MM in certain breeds is suggestive of a genetic component to their development. Dog breeds at a higher risk of melanocytic tumours include poodles, Beauceron shepherd, Rottweillers, schnauzers, Scottish terrier and Labrador retrievers (Gillard et al, 2013). Interestingly, 98 per cent of melanocytic lesions suffered by poodles were oral, further supporting the significance of breed in certain forms of the disease.

The presentation of melanocytic lesions varies by location. Typical clinical signs of COMM often include a pigmented oral mass which can arise from any of the oral structures including, occasionally, the tongue, and resulting in dysphagia, halitosis, oral bleeding and facial deformation.

CDMM lesions arise from around the nail or, occasionally, in the webbing between the toes or from the footpad. These lesions are often pigmented and can be ulcerated and painful. Cutaneous lesions are quite variable in appearance, benign lesions are typically pigmented, often flattened nodules with well demarcated borders on haired skin; malignant lesions are typically less well defined, can be ulcerated and sometimes lose pigmentation and are more frequently at muco-cutaneous junctions.

Diagnosis

Diagnosis of melanocytic lesions is best made by histopathology after a biopsy. When pigment-laden spindloid cells are seen, a diagnosis can be made quite confidently. However, more aggressive melanomas (most often COMM) can show anaplastic features and/or sometimes lose pigment production (so called amelanotic melanoma).

These melanomas can sometimes be mistaken for other tumour types, including carcinoma, so it is sensible to consider requesting immunohistochemistry for poorly differentiated oral tumours when there is any doubt about the diagnosis. Staining with various combinations of S100, Melan A, tyrosinase, PNL2 and

Table 1. (WHO) TNM-Based Staging Scheme for COMM.

T: Primary Tumor
T1 Tumor ≤2 cm in diameter
T2 Tumor 2-4 cm in diameter
T3 Tumor >4 cm in diameter

N: Regional Lymph Nodes
N0 No evidence of regional node involvement
N1 Histologic/cytologic evidence of regional node involvement
N2 Fixed nodes

M: Distant Metastasis
M0 No evidence of distant metastasis
M1 Evidence of distant metastasis

Stages
Stage I = T1 N0 M0
Stage II = T2 N0 M0
Stage III = T2 N1 M0 or T3 N0 M0
Stage IV = Any T, any N, and M1

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TRP-1 and TRP-2 have been shown to be effective for identifying melanomas with little pigmentation.

Histologically, almost all cases of CDMM – and the vast majority of cases of COMM – appear malignant; this compares with around 45 per cent of cutaneous melanocytic lesions (Gillard et al, 2013). Consistent with this, COMM and CDMM are typically highly aggressive locally and carry a high risk of metastasis; whereas small well-defined cutaneous melanocytic tumours are often benign.

Histologic features suggestive of malignancy include high frequencies of nuclear atypia and cell depigmentation; additionally, ulceration and invasion into deeper tissues are also associated with a less favourable prognosis. Proliferation indices are also useful for determining likely behaviour.

A mitotic index of ≥4 mitoses/10 high-powered fields (hpf) for oral melanocytic neoplasms or ≥3 mitoses/10 hpf for CDMM and cutaneous melanocytic neoplasms have been associated with a poorer outcome. Ki-67 is a marker of cellular proliferation that is an independent prognostic factor for local recurrence, metastasis and death in patients with mast cell tumours. Similarly, higher frequency of Ki-67 expressing cells is associated with a poorer prognosis in melanocytic tumours (Smedley et al, 2011).

Staging

Owing to the high frequency of metastatic behaviour shown by MM, staging should be considered for all melanocytic neoplasms and should be mandatory prior to treatment that carries significant morbidity, such as excisional surgery. In addition to the histologic features outlined above, further considerations when staging melanoma patients include tumour size and the presence of local lymph node and distant metastases.

It is now well recognised that lymph nodes that are palpably normal can contain metastatic tumours cells. In fact, approximately 40 per cent of palpably normal lymph nodes were found to contain tumour cells when aspirates were collected in one study of MM (Williams & Packer, 2003); so aspiration of local lymph nodes is recommended in all cases.

Lymph node cytology can sometimes be difficult to interpret as macrophages containing melanin (melanophages) are often present and can be easily mistaken for melanocytes. The high frequency of metastasis dictates that it is safest to assume such lymph nodes are affected by metastasis. Another source of confusion is the presence of melanocytes with few pigment granules in amelanotic MM.

Unfortunately, the metastatic pattern of melanoma is not entirely predictable, but, as metastasis to the thorax and abdomen portend a grave prognosis, imaging of the thorax in all cases and the abdomen in all cases – except perhaps cutaneous melanoma lacking any of the worrisome prognostic features outlined above – is recommended.

There is a WHO staging system for COMM that ascribes stage based on tumour size and the presence of lymph node and distant metastasis (**Table 1**) and similar principles undoubtedly apply for CDMM.

This staging system is useful for stages I – III, but should be considered in combination with the other prognostic factors outlined above, in particular proliferation indices (MI and Ki-67). Stage IV malignant melanoma carries a grave prognosis with most patients living less than six weeks.

Surgery

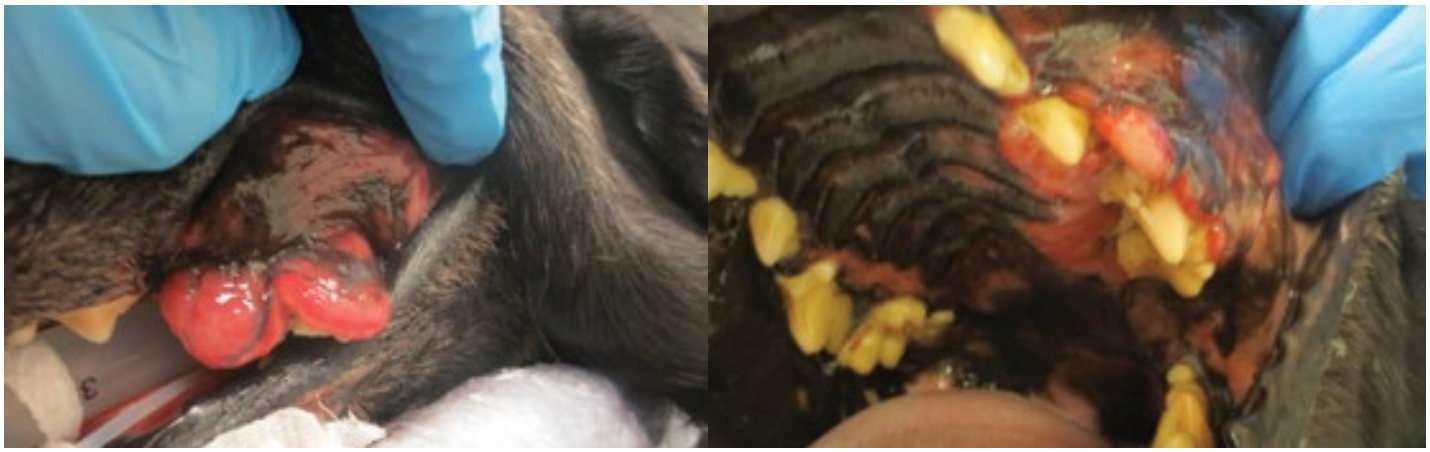
Early detection and surgery remains the most effective method for controlling local disease.

Benign cutaneous melanocytic lesions will often be excised completely when the tumour and a one centimetre lateral and one facial plane deep margin is taken. The surgical margin required to give a good chance of a complete excision of COMM and CDMM lesions is not well documented, however, a two to three centimetre margin is typically recommended owing to the locally invasive nature of these tumours.

Excision of a margin of this size for CDMM lesions is usually achieved by amputation of one or more digits and associated interdigital webs. The functional outcome after such a surgery is usually good.

Well-defined COMM lesions that are present in mucosal areas not abutted to bone can sometimes be excised with an adequate margin. Surgical treatment of COMM affecting the gingiva is more problematic as these tumours commonly invade the adjacent bone – caudally positioned lesions add a further level of difficulty as evidenced by longer survival times for dogs presenting with lesions cranial to PM3. Unplanned excisions are rarely successful in COMM and might jeopardise the chance of obtaining local control at a later date.

Figure 1. *A comparison of a COMM before and toward the end of radiation therapy.*



Advanced imaging via CT (or MRI) is superior to visual inspection when planning excisional surgeries, as the latter often leads to an underestimation of the volume of tumour present. Where surgeons do not have significant experience of oral surgery, consideration should be given to referring the patient to a specialist surgeon.

Despite the invasive nature of mandibulectomy and maxillectomy, they are usually well tolerated, with many dogs eating within 24 hours of surgery and generally good long-term functional outcomes. The importance of successful excision has been demonstrated by the longer survival times enjoyed by dogs when a complete excision is achieved (Boston et al, 2014).

Radiation therapy

Radiation therapy is another important modality for the management of COMM, where it is used to achieve local and regional control in both the primary and adjuvant therapy settings (**Figure 1**).

In the primary setting, radiation is typically used to treat large tumours that are not amenable to surgical resection or tumours that are considered at high risk of early progression – for example, where metastasis to local lymph nodes has been identified.

In the adjuvant setting, radiation is used after incomplete/marginal excision or at COMM recurrence. Malignant melanoma is considered a radiation-resistant tumour and, therefore, high dose fractions are typically used in a hypofractionated fashion – an example of such a protocol would be four fractions of 9 Grey delivered with a week between each fraction.

The planning of radiation therapy treatments has benefitted greatly from the increasing availability of CT scanning and computerised planning. However, as planning sometimes requires the use of specialised positional set-ups, these often need to be performed at the radiation centre. The typical side effects of radiation therapy include transient (three to six weeks) of mild to moderate inflammation of the skin and mucosa within the radiation field, which can be effectively managed with analgesia, where necessary.

In the longer term, alopecia, leukotrichia and skin fibrosis can be seen in the radiation field. The overall response rate for radiation therapy is 82 to 94 per cent with a greater frequency and duration of responses seen in dogs with smaller tumours. Another prognostic factor identified for dogs treated with radiation therapy is the presence of bony destruction (Proulx et al, 2003).

Unfortunately, in the longer term, a significant proportion of COMM lesions will recur after radiation therapy. This ranges from around 25 per cent in patients treated in the microscopic disease setting – for instance, after an incomplete excision – to around 45 per cent when macroscopic disease is treated (Proulx et al, 2003).

The highly metastatic nature of many malignant melanomas means that there is a need to consider treatments to control the 'development metastases'. The adjuvant use of chemotherapy has been investigated in a number of studies.

In one study, there was a 24 per cent response rate of macroscopic MM (Rassnick et al, 2001); but, unfortunately, in another study there was no survival benefit following the addition of carboplatin in dogs with adequately locally controlled MM (Murphy et al, 2005). The small number of other chemotherapy treatment approaches trialled have been similarly unrewarding; this mirrors the situation in humans where MM is poorly responsive to chemotherapy.

Vaccination

One relatively new approach to slowing metastatic disease is the use of the canine melanoma vaccine, DNA (Oncept, Merial). This vaccine has a licence for stage 2 and 3 COMM and is administered as four doses at two-weekly intervals followed by a booster six months later. The vaccine can currently only be prescribed and administered by specialists and, therefore, a referral is required.

The vaccine is administered using a needle-free injection device (**Figure 2**). After injection, the plasmid DNA enters antigen-presenting cells where human tyrosinase protein is produced and subsequently presented to the immune system with the ultimate aim of producing a cytotoxic T cell response against the tumour.

Tyrosinase was chosen as the target as it is a protein expressed by melanocytes but no other normal cells – so, in principle, this should limit any immune response that develops preventing harmful adverse effects. Human tyrosinase was selected because in previous vaccine experiments using a mouse model xenogeneic (from a species other than the patient) tyrosinase vaccination protected mice from inoculation with melanoma, but syngeneic (from the same species) tyrosinase.

In summary, the xenogeneic protein is thought to be similar enough that the immune system recognises it as tyrosinase; yet different enough that there is not pre-existing tolerance to it and, therefore, an immune response can develop.

Administration of this vaccine is safe and has been shown to induce an immune response to tyrosinase in normal dogs. In another study, dogs with locally-controlled stage I – III COMM that received the vaccine had superior survival to a similar group of controls previously treated by local tumour control alone (Grosenbaugh et al, 2011).

Similarly, dogs with CDMM treated with a variant of this vaccine (mouse rather than human tyrosinase) had a superior survival rate compared to that reported in the literature (Manley et al, 2011). Leading members of the veterinary oncology community have recently called for a prospective randomised clinical trial of Oncept in order

Figure 2. *Use of the needle-free injection device to administer Oncept vaccine.*

to better quantify any benefit (Vail, 2013).

Conclusion

Melanocytic lesions are relatively common and malignant melanomas remain difficult to treat owing to their locally aggressive nature and propensity for metastasis. Nonetheless, increasing availability of advanced imaging, surgical expertise and radiation therapy are leading to better outcomes for these patients.

Similarly novel medical therapies – such as anti-cancer vaccines, novel drugs and monoclonal antibody treatments – are likely to become increasingly available in the years to come enhancing our ability to prevent and treat melanoma metastasis. ■

PPD Questions

1. Dog breeds predisposed to MM include:

   A. Dalmation
   B. Poodle
   C. Schnauzer
   D. Labrador retriever
   E. All of the above

2. The response rate of macroscopic MM to carboplatin is:

   A. 0%
   B. 24%
   C. 56%
   D. 80%

3. The cell type that is thought to be most important to stimulate with an anti-cancer vaccine is:

   A. Macrophages
   B. Plasma cells leading to anti-tumour antibodies
   C. Cytotoxic T cells
   D. Regulatory T cells

4. The response rate of MM to radiation therapy is approximately:

   A. 40%
   B. 70%
   C. 20%
   D. 90%

5. The following are considered to be negative prognostic factors in COMM:

   A. MI ≥3 mitoses/10 hpf
   B. Bony destruction
   C. Lesion caudal to PM3
   D. Thoracic metastasis
   E. All of the above

Answers
1.B,C&D 2.B 3.C 4.D 5.E

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Alice graduated from Hartpury College having gained a BSc(Hons) in Veterinary Nursing Science. She initially spent time working in a mixed first-opinion practice in Bristol. In April 2011, Alice moved to join the nursing team at Langford Veterinary Services. At first she worked in all areas of the hospital, but found her real passion lay with feline medicine; so she now works as a core feline nurse within the Feline Centre and has completed the 'ISFM Certificate in Feline Friendly Nursing' achieving a distinction.

**Suggested Personal & Professional Development (PPD)*

BEHAVIOUR

'Cat-titude' – feline-friendly nursing and handling techniques

When we consider how best to interact with other people, we know it is vital to appreciate their individual personality, experiences and life style and it is essentially this understanding that enables us to forge relations with them. We must, therefore, consider these vital skills when interacting with our feline patients and remember that we can only really appreciate another species if we fully understand its vital biology.

The social structure of cats is very different to that of people and dogs; so at times it can provide challenging situations for veterinary staff. The cat functions efficiently as a solitary animal, yet has the ability to form social interactions that are far more complex than that of a herd or pack animal.

Cats are predatory, and as obligate carnivores, have evolved physically to be specialist hunters yet still have the potential to be preyed upon. It is because of this that in times of fear the cat will react defensively in order to attempt escape or to protect itself – the 'fight or flight' response. Within the veterinary situation, such reactions may be misinterpreted as signs of aggression when, in fact, they are indicative of fear.

"Body postures and facial signals can tell us a great deal about a cat's mood"

Cats are solitary and self-reliant and have no biological requirement for companionship – unlike dogs or people. For some cats, casual low intensity encounters with humans will suffice, whereas others may be more human orientated. It is as a consequence of this solitary existence that their need for survival is so strong.

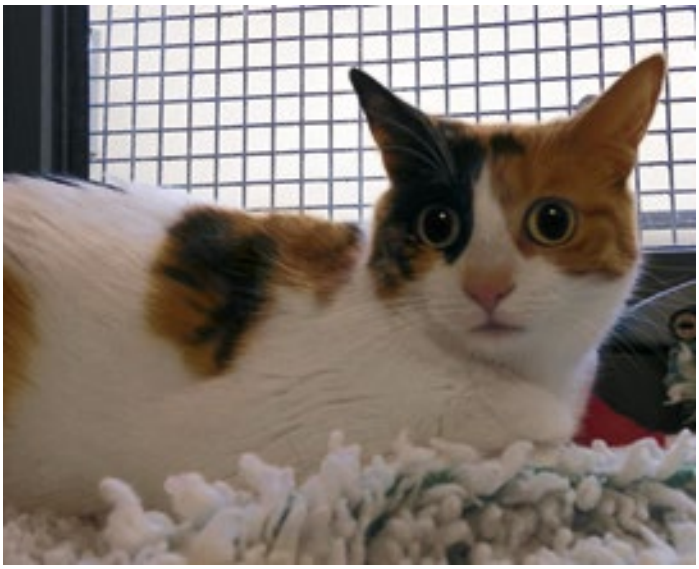
Cats are small mammals and as they choose to live relatively independently they cannot afford to get hurt. They will always try to avoid physical confrontation at all costs and will generally attempt to intimidate using vocalisation and posture as much as possible.

Understanding feline body language and communication

Cats use a variety of methods to communicate – including tactile, visual, olfactory and postural cues. Such displays of elaborate body and tail posture, facial expressions and vocalisations are all deployed in an attempt to avoid conflict. Only when these are not respected and the individual is unable to hide or flee, will it resort to fighting in order to defend itself.

Figure 1. *The cat shows increasing signs of fear as veterinary staff approach. On initial entry into its housing, the cat demonstrates mydriasis and an alerted ear position with mild rotation.*

Figure 2. *As veterinary staff move closer to the cat, a progression in mydriasis and ear rotation can be seen, as well as a crouched body position.*



Figures 3 & 4. *The towel provides a secure, yet comfortable, means of restraint.*

By understanding these communicative cues, veterinary staff can recognise the signs associated with fear and respond appropriately, leading to a vastly improved interactive experience.

Tactile communication is manifested as rubbing, grooming or kneading and indicates an affiliate, friendly relationship. The neck bite/scruffing is a signal that is used only in three contexts – for transporting young, for sexual mounting, or as a means to dominate during a fight. Scruffing the feline patient in the veterinary environment will resemble a display of dominance and is, therefore, not appropriate for use when trying to convey a safe, feline-friendly environment.

Body postures and facial signals can tell us a great deal about a cat's mood – for instance, whether it is fearful, anxious or relaxed. Ear position plays a vital role in the interpretation of these moods and can enable us, and other cats, to understand calm behaviour and prevent fearful behaviour from escalating.

Erect ears show that a cat is alert and focusing on a stimulus; ears flat to the head show intimidation, especially if combined with a low body position; ears folded back and flat indicate fear.

Visual signals are often used to diffuse a potential fight or to signal defensive/offensive aggression and may be used as a form of passive aggression. Dominant individuals will often stare at others for prolonged periods to elicit a threatening demeanour. Tail position is another important method of communication for the cat.

Some feline tail postures have developed specifically to communicate with humans – for example, the 'vertical tail' seen when greeting owners. The tail is held upright, sometimes with a slight kink to the tip, often quivering and is used in combination with vocalisation and rubbing. Such behaviour signals a relaxed, friendly intention and displays clear familiarity and social bonding. In contrast to this, a 'straight' downward-facing tail can suggest an offensive posture and, if combined with a strong wag, may suggest agitation or an aroused state.

Body height/posture play a specific role in feline communication and are intended as either antagonistic displays or to inhibit aggression. Cats will alter their body size to convey either confidence or fear. An intimidated cat will try to make itself appear larger in front of an aggressor by fluffing up its coat – in particular the tail – and adopting an arched back and side-on stance. Whereas a cat on the attack will adopt an aggressive stance, lying low ready to pounce or extending its back legs to stand at full height while displaying piloerection over the back.

The submissive/fearful cat tends to crouch low to the ground in an attempt to appear as small as possible and, in some cases, may roll over and expose the stomach area in submission to the aggressor.

Finally, vocalisation may become more dramatised during times of emotional stress. Defensive aggression towards people or other cats may elicit hissing, growling and spitting and tends to increase in volume as the cat becomes more aroused.

Cats use this communication behaviour alongside specific body language to express their displeasure and to avoid physical conflict that may risk injury. It is only when such behaviour is ignored that a cat will engage in a physical encounter. Therefore, it is essential that veterinary staff are able to recognise in advance the signs of fear aggression to ensure appropriate and careful handling during examination and hospitalisation (**Figures 1 & 2**).

> "Visual signals are often used to diffuse a potential fight or to signal defensive/offensive aggression"

Feline-friendly nursing and handling

When considering how best to manage the feline patient in practice, we must implement a feline-friendly ethic, both physically and mentally. Simple physical alterations to the veterinary environment can provide essential 'cat-titude' within the practice and can make all the difference to a cat's experience at the hospital. (Such physical modifications will be discussed in depth in a second article which will be published in *Veterinary Practice Today* early in 2015).

Alongside implementing environmental adaptations, it is also essential that veterinary staff promote an empathetic feline-friendly attitude and are confident in their ability to recognise the subtle behavioural changes related to anxiety and fear in the cat. Appropriate handling of the feline patient can make all the difference in its compliance and is an essential skill of any veterinary nurse.

In some cases, despite the best efforts of veterinary staff to promote feline-friendliness, fear aggression can still occur and it is, therefore, essential that such patients are handled in an appropriate manner. The goal is to handle the patient respectfully, reducing threats and thereby lowering the cat's need to react defensively.

As mentioned previously, scruffing is an unnecessary act of dominance and will not provide a positive experience for the cat. It is important to consider how you will be perceived from the cat's perception and to be careful not to mimic the behaviour of a predator or an aggressive cat.

When approaching the feline patient, consider your body language and tone of voice.

"The submissive/fearful cat tends to crouch low to the ground in an attempt to appear as small as possible"

Watch how these are perceived by the patient and be prepared to modify your behaviour accordingly. Using a calm tone of voice and slow movements that are not indicative of fear or anxiety will help reassure the patient. Using light upper register tones mimic that of chirruping, which cat's do when they are relaxed. The use of low tones or 'shush'/'psst' are not recommended as these are the equivalent to a hiss or an aggressive growl.

Try to present yourself in a non-threatening manner that is not representative of an aggressor – sitting down or crouching near the floor with a relaxed stance – and try to avoid direct facial staring which is a form of passive aggression between cats. It is important that these principles are followed to reduce anxiety before physical contact is made.

Correct handling techniques are vital to ensure the safety of both patient and staff member, particularly when dealing with the challenging individual. Restraining cats is often best achieved with a 'less-is-more' approach, and even the challenging cat can be managed by applying this principle. The use of a towel is usually all that is needed to restrain the patient securely and provides protection and security for both cat and handler via a minimal and comfortable restraint (**Figures 3 & 4**).

Using bags, masks and gloves is generally far more difficult and often causes unnecessary stress for all involved.

Accessing or transferring the patient from the cage to a carrier, or vice versa, may often prove difficult; however, in many cases a clinical examination – and even blood sampling – can be achieved within the base of the patient's carrier, and where necessary using a towel to gently cover the head.

A towel is again very useful when the patient needs to be moved in and out of its kennel, and can be carefully placed over the cat before lifting it up. Care should be taken to ensure a hand is placed lightly over the patient's neck, ensuring the head is always facing away from the handler. Lifting the patient up past the face should always be avoided. In some cases, where igloo beds or boxes have been provided, it may be possible to move the entire item into the cat carrier.

Clinical examinations, blood sampling and intravenous catheter placements are generally achievable using towel restraint and, providing the patient is not unduly stressed, can typically be managed this way. It is, however, vital that procedures are only performed if the patient is coping, otherwise ongoing perseverance is not beneficial (**Figure 5**).

Summary

Successful feline nursing requires an in-depth knowledge of the evolutionary behaviour of cats and the ways in which they perceive human interaction. Understanding life from a cat's perspective and providing an empathetic attitude towards its nursing care will ultimately improve the experience for both the patient and the veterinary staff. ■

Figures 5. *It is, vital that procedures are only performed if the patient is coping.*

PPD Questions

1. Which four types of behaviour cues do cats use to communicate?
2. A cat's ear position can tell us a great deal about how it is feeling. Describe the positions used by the cat to convey contentment vs. fear.
3. Why is the 'fight' response so often misunderstood in the veterinary situation?
4. Why would scruffing a cat be considered as a negative rather than a useful method of restraint?
5. Describe how best to handle the 'challenging' cat?

Further reading

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Answers

1. Tactile, olfactory, visual and postural.
2. Erect ears show that a cat is alert and focusing on a stimulus; ears flat to the head show intimidation, especially if combined with a low body position; ears folded back and flat indicate fear.
3. As solitary individuals cats have a strong drive to survive. In general, cats avoid conflict at all costs and in most confrontational situations will choose to flee in order to protect themselves. In practice, the cat is unable to remove itself from a situation and may choose to react in a 'fear aggressive' way to protect itself. This can so often be misinterpreted within veterinary practice focus causing the cat to be considered as 'difficult' rather than just very fearful.
4. The neck bite/scruffing is a signal that is used only in three contexts – for transporting young, sexual mounting or as a means to dominate during a fight. Scruffing the feline patient in the veterinary environment will resemble a display of dominance and is, therefore, not appropriate for use when trying to convey a safe, feline-friendly environment.
5. Restraining cats is usually best achieved with a 'less-is-more' approach and even the challenging cat can be managed with this principle. The use of a towel is usually all that is needed to securely restrain the patient and provides protection and security for both cat and handler via a minimal and comfortable restraint. For some patients who require examination, it may be easier to allow them to remain within their carrier or bed and use a towel to move them around as necessary.

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**Suggested Personal & Professional Development (PPD)*

SIDEWAYS VIEW

Vets are to Welfare as Lawyers are to Justice

Veterinary surgeons are concerned about animal welfare. That is, without doubt, true. There should be nothing but praise for the thousands of welfare-minded girls and boys who decide to take a career in veterinary medicine, go through the years of toil as undergraduate students (with occasional moments of relaxation!) and devote their lives to a job that helps reduce animal suffering.

Against this backdrop, however, veterinary surgeons are criticised for being involved in practices and circumstances that cause animals to suffer. While readers may instantly think of farm or laboratory settings, there are many breeding, production or performance-enhancing interventions across the spectrum of veterinary practice work that fall into this category, including the equine and small animal sectors.

One response to this criticism is to deny the accusation – arguing that whatever form of intervention is under scrutiny, its use is "just fine" (in some cases arguing that it must be fine if there are vets involved). Yet this "No problem here, please move along" tactic is not only unlikely to be believed, but also makes vets look even worse for actively defending those practices.

A second response is to accept that vets are not really all that bothered about welfare – that there are just some 'rotten apples' who do the 'naughty' stuff. But I don't think that is true.

There is definitely scope for improving animal welfare teaching, role models and

relevant CPD in the UK, Eastern Europe, Asia and elsewhere. But I haven't yet met a vet who expresses a complete disregard for animal pain and suffering – even if there are some who misunderstand science and still relate welfare predominantly to physical signs. Perhaps they used to exist, but I'd hope they don't now (or at least keep quiet).

So I want to explore a third response: that there are cases where those welfare-minded professionals can become diverted into work that is less than perfectly welfare-focused. For this, a comparison with lawyers proves surprisingly useful. Lawyers are motivated to – and meant to – promote and prioritise justice; in the same way that veterinary surgeons are motivated and meant to promote and prioritise animal welfare.

Both professions swear oaths. Both devote considerable time to voluntary work. Lawyers are, according to Justice Miller of the US Supreme Court, 'administrators of justice' and to English Judge, Lord Langdale, 'ministers of justice'. The latter adds, 'No counsel supposes himself to be the mere advocate ... of his client ... [his] arguments ... are qualified ... by considerations affecting the general interests of justice.'

The case(s) of lawyers

Many people would think there are cases where the legal processes fail to achieve 'real', natural, justice – defending the guilty and unrepentant wrongdoer, persecuting the oppressed, helping the big corporations sue the 'little men' (or women, though that makes me think of the March sisters!). Surely

"Lawyers are motivated to – and meant to – promote and prioritise justice; in the same way that veterinary surgeons are motivated and meant to promote and prioritise animal welfare"

this isn't all attributable to 'naughty' lawyers unfettered by concerns of justice?

Rather, I think there can be a wrong assumption by 'good' lawyers that because legal practice is intended to increase justice overall, any application of the law in a particular case is, therefore, unquestionably just. But this is wrong. One can say that each 'action' may conform with overall just legal rules, but that these can lead to unjust outcomes.

For example, a big corporation can legitimately pay for a posse of lawyers who all follow court rules – but in such a way that leads to an unfair outcome. This is tricky: a lawyer might want to avail a defendant of their just 'legal rights' when that then leads to an unjust outcome of getting them off.

So legal professionals need to consider the wider sense of overall justice. This creates a genuine moral dilemma - the case in hand versus the wider matter of justice.

For some cases, lawyers may then refuse that case – if they think the defendant is guilty or the litigant in the wrong, then they should preserve their integrity and refuse. For other cases, lawyers may decide to help, but then also lobby for changes in the legislative and judicial system so that, in future, their legal actions do lead to just outcomes.

Other lawyers 'offset' the footprint of their legal activities by providing large amounts of organised pro-bono work, thereby offsetting the injustice of big corporations' legal budgets by helping the 'little guys' out.

The case(s) of veterinary surgeons

An equivalent for veterinary surgeons is that they may help with particular cases in ways that risk our losing sight of the bigger picture. Again, it might be thought that any particular veterinary action is pro-welfare purely because it is veterinary. But it is the same wrong assumption that because veterinary practice is intended to improve welfare overall, any veterinary procedure in a particular case is, therefore, unquestionably pro-animal welfare too.

This is tricky too - helping patients already being subjected to a harmful procedure may also actually perpetuate that overall undesirable practice. On-farm examples might be tail-docking, beak trimming and prophylactic antibiotic usage. All have welfare benefits on farm systems that otherwise fail to meet animals' needs; yet allowing those farms to tail-dock, beak trim or give routine antibiotics means that those farms can continue successfully to cause those harms.

(And lawyers help those industries to continue too because such systems are rarely allowed to be changed by the legal system – witness the recent judicial review case brought by Compassion in World Farming (CIWF), where the judge accepted broiler chicken growth rate as a welfare problem, but declared it to be a matter for Parliament rather than the Judiciary.)

> "Helping patients already being subjected to a harmful procedure may also actually perpetuate that overall undesirable practice"

So veterinary professionals also need to consider the wider global sense of animal welfare. This again creates a genuine moral dilemma - the case in hand versus the wider matter of animal welfare.

In some cases, veterinary surgeons may then preserve their integrity and refuse to help an animal in a particular way in order to avoid perpetuating animal welfare problems. Of course, they should not refuse any help; but may limit their offer to what will not be harmful overall.

So, only offering a breeder of brachycephalic bulldogs a 'Caesarean-and-spay' – and not a Caesarean without spaying – provides help to the patient while avoiding wider harms of perpetuating breed-related conditions. And if the owner refuses that option, he or she is responsible for the suffering.

In other cases, veterinary professionals may help those animals while lobbying more widely to bring about significant legislative or industry changes such that, in future, their veterinary actions do lead to better welfare. This seems odd – it involves doing something while seeming to lobby against it! But it is actually about tackling the causes of the need, and sometimes this involves removing the option of a veterinary quick fix.

Some cases in point

A good example is how small animal veterinary surgeons continue to help puppies suffering from inherited disorders while also campaigning for better breeding. Farm vets could lobby to ban tail-docking while still authorising it. Equine vets could similarly lobby to stop zero-sum (and sometimes useless) performance enhancements. Indeed, this has the benefit that those lobbying are those who know most about it.

Veterinary surgeons can also 'offset' the footprint of their veterinary activities by providing pro-bono help. Given the amount of welfare-minded passion within the profession, I am always surprised at how few organised, corporate pro-bono activities there are within the veterinary profession – especially compared to the legal profession. Indeed, most veterinary surgeons (and some lawyers) charge animal welfare charities full rates.

Hopefully, we will see more and more vets standing up and helping out on the wider animal welfare issues. We can certainly do that while still helping our patients. ■

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BSc (Hons)

Jane is an information scientist who has worked for the Veterinary Poisons Information Service (VPIS) and the human poisons service at Guy's Hospital, on and off since 1984, and has also worked in the pharmaceutical industry.

Jane was a founder of the veterinary service in the 1980s and has recently returned to work for the service in the 24-hour rota team.

**Suggested Personal & Professional Development (PPD)*

POISONS

NSAID overdose in dogs

Questions about non-steroidal anti-inflammatory (NSAID) drugs account for the largest number of enquiries to the Veterinary Poisons Information Service (VPIS) every year – equivalent to around eight to nine per cent of our total enquiries.

There are many different NSAID preparations intended for use in humans. They are available, both as prescription and over-the-counter medication, in many different formulations – tablets and capsules, liquid suspensions, sprays, injections and topical preparations. Some preparations may contain other active agents including codeine, paracetamol, phenylephrine or pseudoephedrine - especially those formulations indicated for the relief of cold and 'flu symptoms.

The ingestion of any NSAID intended for human use is potentially dangerous and problematic for dogs, and the most commonly implicated of these are ibuprofen, naproxen and diclofenac. The NSAIDs intended for therapeutic use in animals include carprofen, meloxicam and firocoxib and it is not uncommon for owner error to result in overdosage of these too.

Mode of action

The NSAIDs reduce the production of prostaglandins by inhibition of cyclo-oxygenase enzymes involved in their synthesis.

In the gastrointestinal tract, prostaglandins have a cytoprotective function as they control production of gastric acid, stimulate secretion of mucus and bicarbonate by the gastric epithelium and maintain mucosal blood flow by causing vasodilatation. Deficiency will result in increased gastric acid secretion and reduction in mucus production and mucosal blood flow. These effects, together with the acidic nature of the drug itself, all increase the risk of ulcer formation.

In the kidneys, prostaglandins maintain afferent arteriolar dilatation regulating renal blood flow and glomerular filtration rate. They also have a role in the control of renin release and maintenance of water balance. NSAID inhibition of prostaglandin synthesis will result in reduction of renal blood flow and disrupt normal renal function and homeostatic mechanisms. Constriction of renal arterioles may result in renal papillary necrosis. These effects may be more evident in animals that are dehydrated or volume depleted.

Additionally, metabolic acidosis may result from activity of the parent compound (ibuprofen is a proprionic acid compound) and metabolites and/or inhibition of oxidative metabolism similar to that observed in salicylate toxicity (Volans and Fitzpatrick, 1999).

The mechanism of central nervous system effects is unknown but could be related to ibuprofen-induced metabolic acidosis (Volans and Fitzpatrick, 1999).

Clinical consequences

The clinical effects of these mechanisms of action are generally seen within two hours of ingestion, although renal failure may occur within 24 hours, or even be delayed for several days, which represents a problem if the animal is 'late presenting'.

The different NSAIDs vary in their toxic dose and clinical signs but they all generally

> "The ingestion of any NSAID intended for human use is potentially dangerous and problematic for dogs"

cause gastrointestinal and renal effects. Some, such as naproxen, precipitate a higher incidence of anaemia, but this may be the result of gastrointestinal bleeding.

Initial signs after acute overdose of a NSAID are gastrointestinal in nature with vomiting, haematemesis, diarrhoea, melaena, abdominal tenderness and anorexia. Weakness, ataxia, incoordination, lethargy, depression and drowsiness are often noted.

Ingestion of a large dose may cause dyspnoea, hyperventilation, tachycardia, agitation, hyperactivity, hyperaesthesia, tremors, twitching or convulsions and coma. Metabolic acidosis can also occur after ingestion of a large dose.

From 12 hours onwards, evidence of gastrointestinal irritation and renal impairment can occur, depending on the dose ingested. There may be protracted vomiting, pyrexia, anaemia, anorexia, polyuria, polydipsia, dehydration and collapse. Gastric erosion, ulceration and perforation may occur and can be seen in the absence of any major clinical effects – dark tarry stools may be observed in some animals with gastric ulceration.

"Prompt management ... is aimed at reducing absorption, ensuring adequate hydration and preventing gastrointestinal signs and renal impairment"

Renal failure is initially characterised by oliguria, azotaemia and elevated serum creatinine and urea levels. There may also be hyperkalaemia and acidosis. Hypotensive or dehydrated animals are more at risk from renal effects, as are those with pre-existing renal impairment.

Signs of liver damage (raised liver enzymes, bleeding, icterus) can occur in severe cases (Bolfer et al, 2014). These effects may occur within 24-48 hours of ingestion.

Case management

Prompt management is essential for the treatment of any toxicity involving NSAIDs, and is aimed at reducing absorption, ensuring adequate hydration and preventing gastrointestinal signs and renal impairment:

- If ingestion was recent, induce vomiting or perform gastric lavage
- Give activated charcoal
- Check renal function and electrolytes on admission and at 24 and 48 hours following ingestion
- If possible, blood gases and electrolytes should be checked and corrected, particularly if there is evidence of renal dysfunction and/or oliguria
- If the animal is vomiting, it should receive fluid therapy appropriate to its hydration and perfusion status but at least maintenance intravenous fluids for 24 hours. If the renal parameters are normal after 24 hours, then the dog may be discharged; otherwise continue fluid until renal function is normal
- If there is severe or persistent vomiting, then anti-emetics should be administered. Vomiting may result in dehydration and subsequent renal failure. If adsorbents have been administered this may reduce efficacy of orally administered anti-emetics. In such cases, parenteral administration is preferable

In all cases where treatment has been necessary, the animal should be given ulcer-healing or ulcer-preventing drugs. Evidence from studies on dogs with induced ulcers or increased gastric acid secretion suggests that the optimal regimen would include famotidine and/or omeprazole and misoprostol. Omeprazole is likely to have the most significant and sustained effect on gastric pH.

Cimetidine or ranitidine and sucralfate can be deployed should the optimum choices not be available or accessible; but may not be as efficacious.

The treatment protocol is recommended for seven to 14 days or longer depending on clinical condition, the NSAID taken and the dose ingested. Ideally drug therapy should be started as soon as possible after ingestion. Additional supportive measures include:

- Ensure adequate hydration and a good urine output
- In some cases, dopamine may be used to increase renal perfusion and to minimise renal insufficiency
- Bland diets are recommended – diets high in essential amino acids may also be useful as these are important in prostaglandin synthesis
- Blood transfusion may be required in dogs with gastrointestinal haemorrhage

'Late presenting' animals (>24 hours) that are symptomatic may be at greater risk of renal impairment. They should be started on gastroprotectants, including omeprazole, if gastrointestinal signs are severe. Sucralfate can be given if ulceration is suspected or confirmed.

Misoprostol can be used for prevention or treatment of ulcers and, although it is effective at preventing ulcers, it is not known if it will aid healing of established ulcers. It is probably no better than other gastroprotectants at treating ulcers. It is, therefore, not routinely recommended for 'late presenting' dogs with NSAID overdose. Renal function should be monitored and intravenous fluids given to correct and maintain hydration. ■

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Ivan graduated from the Royal Veterinary College and has been working in general practice in the UK for the last 15 years. He developed a large rabbit caseload made up of first-opinion, second-opinion and rescue work. He also designs and develops a variety of veterinary products.

Ivan is recognised as an international teacher on rabbit airway management and anaesthesia, as well as maintaining his general practice and second-opinion rabbit work.

Rabbit Dentistry: an overview for general practitioners

In the previous issue of *Veterinary Practice Today* we included an article on rabbit dentistry which omitted diagrams of the incisor reshaping. Below are full details of this procedure.

Figure 6. *Dental incisor reshape.*

Figure 1. *Normal occlusion.*

Figure 2. *Maloccluded incisors.*

Figure 3. *Angled cut to both upper and lower incisors – allows sliding force between upper and lower incisors, pushing lower incisors caudally and upper incisors rostrally. The author finds it easier to work without a tongue guard: cutting through 90 per cent of the tooth depth and using molar clippers to remove the last section, thereby protecting the soft tissues.*

Figure 4. *As tooth position changes, step appears on lower incisor.*

Figure 5. *End result – not perfect but sufficient to prevent further tooth trimming.*

DENTISTRY

International guidelines on diabetes in cats

There is hardly a week passes these days without there being a report somewhere in the media highlighting the increase in Type 2 diabetes mellitus (DM) in humans. Interestingly, diabetes is an increasingly common condition in cats too, with a prevalence in first-opinion practice of around 1:100-1:500.

The International Society of Feline Medicine (ISFM) has recently developed consensus guidelines for the practical management of this condition – written by an international panel of independent clinicians and academics, and to be published in the March 2015 edition of *Journal of Feline Medicine and Surgery*. This article outlines the guidelines and current thinking on how to manage this challenging condition.

Pathogenesis

The cause of DM in cats is complex; with similarities to Type 2 DM in humans. The disease develops through the combination of - cell dysfunction and insulin resistance. Insulin resistance can result from several factors, including obesity, pancreatitis, drugs (corticosteroids and progestogens, for instance) and less common endocrine diseases, such as acromegaly and hyperadrenocorticism. Insulin resistance results in hyperglycaemia, which in turn can damage the - cells (glucose toxicity) and reduce insulin production thus creating a vicious cycle resulting in permanent - cell failure.

Risk factors

Most people are aware that obesity and inactivity play a role in the development of human DM and the same is true of cats with risk factors including:

- Cats over seven years of age
- Burmese cats
- Male and neutered cats
- Obese cats (up to four times more likely to develop diabetes)
- Indoor and inactive cats
- Cats treated with glucocorticoids or progestogens

Clinical signs

Classic clinical signs of DM include polydipsia, polyuria, polyphagia, weight loss and lethargy. In some obese cats in the early stages of the disease, weight loss can be hard to appreciate. Early diagnosis is a priority and provides the best chance to achieve remission; so identification of affected cats prior to the onset of severe clinical signs is desirable.

Diagnosis and evaluation

The diagnosis of DM is made by documenting persistent hyperglycaemia and glucosuria. Importantly in cats, stress hyperglycaemia must be excluded. The guidelines state that in most cases stress will not elevate the blood glucose (BG) above 16mmol/l – although this can occur occasionally. Repeat blood and urine glucose measurement and assessment of these parameters at home can help as well as measuring serum fructosamine.

Management

The guidelines state that the main goals of management are to eliminate the cat's clinical signs while avoiding hypoglycaemia and other complications, such as diabetic ketoacidosis.

Importantly, these aims must be matched with the owner's financial and practical commitments. Treatment, therefore, usually includes a combination of dietary management and insulin therapy.

It is important not to rush into dietary change with any diabetic cat; instead consider the current body condition, dietary preferences and owner wishes. A low carbohydrate diet is recommended by the panel. Licensing of insulin will vary from country to country and the insulin choice may depend on this availability as well as clinician preference. Protocols for dietary management and the use of insulin will appear in the *JFMS* article in March and at icatcare.org.

Monitoring

Feline validated veterinary blood glucose monitors should be used in preference to human monitors, which may provide inaccurate results. Blood glucose curves are successfully used to monitor cats with DM, but they do vary from day to day and from blood glucose measurements taken at home. With help and support many owners can successfully measure this at home. It benefits cats by avoiding hospitalisation and providing potentially more accurate results on which to base insulin dose adjustments. It can also be financially beneficial to owners by avoiding hospitalisation.

> "Written by an international panel of independent clinicians and academics, and to be published in the March 2015 edition of Journal of Feline Medicine and Surgery"

Owners should be encouraged to keep a diary of information about their cat as these data – including well-being and body weight, food and water intake, urine production and urine glucose – can be very useful in assessing diabetic control. It is particularly important if blood glucose curves are thought to be affected by stress.

Fructosamine

As mentioned, fructosamine concentrations reflect mean blood glucose concentration over the preceding week. Levels can indicate glycaemic control but are affected by other factors – hydration, age, thyroid status – so the panel recommends following a trend in an individual cat over time to provide the best indication of diabetic stability. ■

The ISFM consensus guidelines provide a useful resource for veterinary professionals caring for cats with diabetes. It can be successfully managed in cats by reducing risk factors, using an appropriate diet and insulin protocol and monitoring regularly. The entire veterinary team should be involved and clients supported and involved in their cat's treatment.

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Imogen graduated from the University of Sydney in 1997, and then spent three years in private equine practice in Australia. She completed a residency in large animal internal medicine at the University of Pennsylvania between 2001 and 2003, and remained there as a lecturer until 2007. She is currently a senior lecturer in equine medicine at the Royal Veterinary College. Her major clinical interests are in gastrointestinal diseases of horses and foals, and current research involves investigating the inflammatory response to colic in horses.

**Suggested Personal & Professional Development (PPD)*

EQUINE FEVER

Investigation of fever in horses: the obvious and not-so-obvious

Measurement of body temperature forms an essential part of the physical examination.

An increased temperature is a common clinical complaint which can accompany a variety of infectious and non-infectious diseases in horses. In many situations, a detailed history, accompanied by a careful physical examination and appropriate diagnostics will determine the cause of the fever. However, in a small number of cases, despite these investigations, the cause of the fever remains elusive, and advanced diagnostic techniques, or therapeutic trials may be required. Investigation of a fever with no obvious cause can be both challenging and frustrating, and in some cases is only solved on the post-mortem table.

What is a fever?

Fever is defined as a regulated elevation in thermal set point, or more simply, an increase in body temperature. While in most situations, a horse with an elevated rectal temperature will have a fever, in rare situations a diagnosis of hyperthermia - which involves a loss of the ability to regulate body temperature - is made.

In both adults and foals, the temperature can vary between morning and evening by up to 1°C, with the lowest temperature typically in the morning, and the highest in the late afternoon.

- The average normal temperature of an adult horse is 38°C (100.5°F)
- The normal temperature of a foal is slightly higher, ranging from 37.8°C to 38.9°C. (100°F to 102°F)

Regulation of body temperature

Body temperature is regulated via neurons within the hypothalamus which sense changes in core body temperature. When an increase in body temperature is sensed, behavioural and physiological responses are initiated to lose heat.

Hyperthermia

If there is a loss of the ability to dissipate heat, hyperthermia can occur. Hyperthermia differs from a true fever in that the regulatory set point is unchanged. Situations in which hyperthermia may occur include:

- Anhidrosis
- Sustained or high-intensity exercise
- Heat stroke
- CNS disorders
- Drug or toxin reactions

Several syndromes in foals which result in hyperthermia have been reported. The aetiology is unclear, although it is likely to result from a lack of ability to regulate body temperature. A syndrome of idiopathic – or transient – tachypnoea, accompanied by an increased rectal temperature, has been reported in Clydesdale, miniature horse, thoroughbred and Arabian foals.

Clinical signs usually develop within several days of birth, and can last for several weeks. These signs appear to be worse during warm and humid weather, and it is thus presumed that the increased respiratory rate occurs in an attempt to dissipate heat. There is no specific treatment, although maintaining foals in a cool environment, clipping and providing cool water can help. Most foals will grow out of this syndrome.

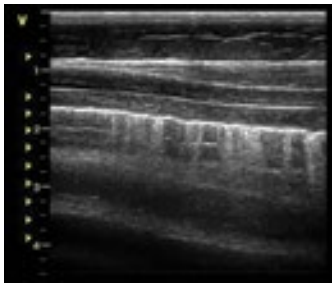
More recently, a similar syndrome has been reported in Friesians, Belgians and other draft horse/draft-cross foals. The syndrome appears similar to that affecting neonatal foals, although clinical signs can be delayed until six weeks of age or older. Infectious causes of an increased temperature, in particular sepsis and *Rhodococcus equi* pneumonia should be ruled out before making a diagnosis of idiopathic hyperthermia/tachypnoea (**Figure 1**).

Pathogenesis of 'true' fever

In the vast majority of situations, an increased rectal temperature will be caused by a 'true' fever, rather than hyperthermia. Fever is most commonly caused by infectious conditions – in particular viral and bacterial infections – although it can be a component of many inflammatory, immune-mediated and neoplastic conditions.

In response to infection or inflammation, cytokines are

Figure 1. *Thoracic ultrasound image obtained from a foal with R. equi pneumonia showing multiple 'comet tail' artifacts suggestive of pleural roughening.*



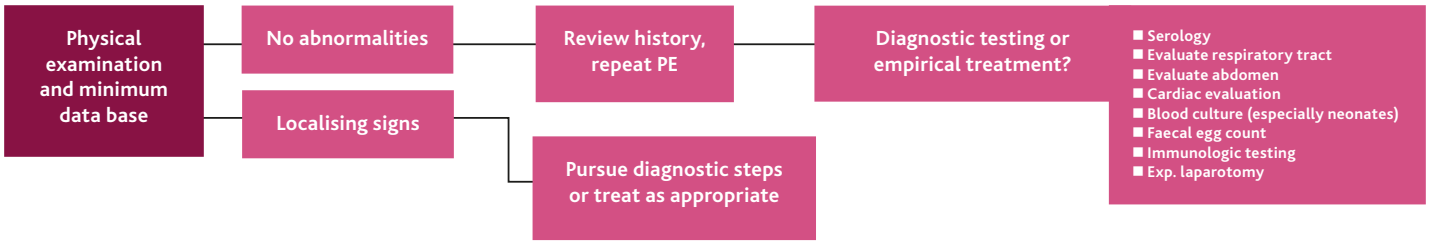


Figure 2. *Approach to a horse with a fever.*

produced by cells such as monocytes/macrophages, neutrophils and lymphocytes. These cytokines, or endogenous pyrogens, include IL-1, TNF, interferon and IL-6. Pyrogens act within the brain to produce prostaglandins, which ultimately results in an increase in the regulatory set point within the hypothalamus, causing an increased core temperature.

This response is controlled so that the temperature does not continue to increase – for example, TNF acts via a negative feedback mechanism to prevent further TNF release. The importance of prostaglandins in the development of fever explains why NSAIDs, such as flunixin meglumine, are typically effective at reducing a fever.

Should we always 'treat' a fever?

Beneficial effects of fever

Fever is part of the physiologic response to invasion of infectious agents. An increased core temperature is an important part of the defence mechanism against the invading organism. The presence of a fever enhances host defences via a number of different mechanisms, including increased activity of phagocytic cells and lymphocytes and increased sequestration of iron.

Figure 3*. Obtaining a rectal biopsy using mare uterine biopsy forceps.*

Adverse effects of fever

Temperatures above 41°C, however, can result in adverse effects, including increased catabolism and cytokine dysregulation.

Because of the potentially beneficial effects of a fever, it may not always be necessary to 'treat' a fever with NSAIDs unless it appears to be making the horse depressed and inappetent. If NSAIDs are utilised, it is important to remember that this can interfere with the ability to monitor response to treatment – is the fever reducing because of the NSAIDs or because the horse is responding to a specific therapy, such as antimicrobials?

Investigation of a fever

The aim of the initial investigation (**Figure 2**) should be to determine:

- Whether this is an individual animal problem, or part of a herd problem
- Whether, based on the history and physical examination (PE) findings, a diagnosis can be made
- A list of differential diagnoses if a definitive diagnosis cannot be made
- What, if any, diagnostic tests need to be submitted
- What, if any, treatment is necessary

The first step in answering these questions is to establish as complete a history as possible - both for this horse and also any in-contact horses - and then to perform a complete physical examination.

1. Is this an individual animal problem, or part of a herd problem?

It is essential to establish as early as possible in the diagnostic process whether this is the only horse affected, or whether other horses are showing similar clinical signs. Early identification of contagious diseases, such as Strangles or influenza, can help prevent a widespread outbreak. The owner of the horse being examined may not know if other horses are affected, especially in a shared barn, so questioning barn/yard owners or managers may be useful.

Travel history of all horses in the yard is also important – older horses in particular may become subclinically infected with agents such as *S. equi* and influenza virus, acting as silent shedders without showing clinical signs. Vaccination history is an important part of the history; although vaccinated animals can still become infected and shed organisms.

2. Based on the history and PE findings, can a diagnosis can be made?

In some situations, after establishing the history and performing a physical examination, a diagnosis may be made. Clinical experience, as well as classic clinical signs/history is used on these occasions. Examples would include a horse with clinical signs such as draining submandibular lymph nodes, respiratory stridor and fever, that has been in contact with a new arrival to the yard. A diagnosis of Strangles can be made at this point, although diagnostic tests could be used to confirm the definitive diagnosis.

3. Establish a list of differential diagnoses if a definitive diagnosis cannot be made

In many situations, identification of the major body system affected will allow a list of differential diagnoses to be constructed, even if a definitive diagnosis cannot be made. For example, the major differentials for a horse with abdominal discomfort, fever and loose faeces would include enterocolitis, peritonitis, abdominal abscess and, possibly, abdominal neoplasia.

4. What, if any, diagnostic tests need to be submitted?

Diagnostic tests can be used to further refine the differential diagnosis list. Since most owners will not be willing to pay for all possible diagnostic tests, targeted testing will probably be required (**Tables 1-6 and Figures 3-5**).

There are two main aims in this situation.

First, testing for diseases that may be contagious, exotic or zoonotic. Second, testing to help guide treatment and establish a prognosis. The aim of the testing will vary according to the list of differentials. For example, a horse that has recently

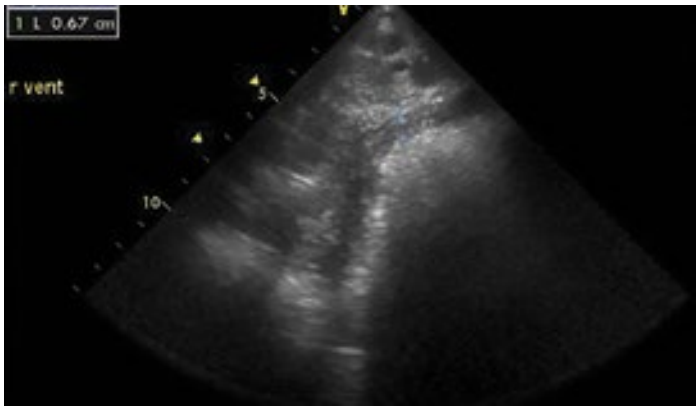


***Figure 4**. Abdominal ultrasound showing thickening of the large colon wall in a horse with suspected right dorsal colitis.*

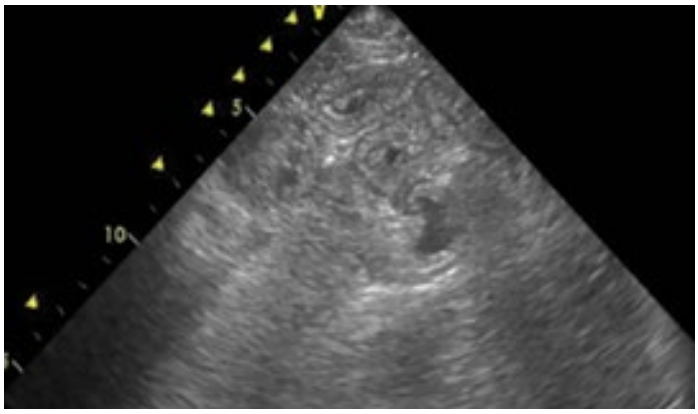


***Figure 5.** Abdominal ultrasound showing thickening of the small intestine (multiple loops) in a horse with suspected inflammatory bowel disease.*

Table 1. Non-specific signs (including lethargy, anorexia and weight loss)

Sample	Test	Evaluation/interpretation
EDTA blood	Haematology	Leucopaenia suggests acute demand. Often seen with GI disease (may be response to endotoxaemia rather than infection). Leucocytosis more common in chronic conditions such as Strangles or R. equi Lymphopaenia may be seen with viral infections or as part of 'stress' response
Serum/plasma	Biochemistry Acute phase proteins Coggins (EIA)	May identify organ(s) affected SAA increases rapidly and decreases rapidly. Fibrinogen has more delayed response and resolution. Cannot differentiate between inflammation and infection. Iron levels may be more sensitive If history/geographic location are suggestive

Table 2. Signs localised to respiratory tract (including cough, nasal discharge, lymphadenopathy, abnormal auscultation)

Sample/procedure	Test	Evaluation/interpretation
Endoscopy	Upper and lower respiratory tract	To identify possible sites of infection and guide further sampling – e.g. if obvious drainage from guttural pouches, investigate this area rather than lower respiratory tract (LRT)
Tracheal fluid	Cytology, culture	A percutaneous sample is recommended. Obtaining the sample through the 'scope makes culture results difficult to interpret, as nasopharyngeal contamination is likely – organisms likely to cause LRT infection are typically normal inhabitants of the nasopharynx. Positive culture without cytologic evidence of infection (i.e. neutrophils) is likely a contaminant
Nasopharyngeal swab, guttural pouch lavage	Culture, PCR	To identify *S. equi* infection/carriers
Nasopharyngeal swab, whole blood, serum	Virus isolation, PCR, antibody titre	For identification of respiratory viruses such as EHV and EI
Ultrasound	Thorax	Evaluation of pleural cavity and pleural surface – abnormalities overlying aerated lung will not be identified **(Figure 1)**
Radiographs	Thorax	Portable machines can be used for foals, otherwise typically restricted to referral hospitals
Pleural fluid	Cytology, cell count, protein, culture	Submit if fluid is identified on ultrasound evaluation

Table 3. Signs localised to gastrointestinal tract (including colic, diarrhoea, oedema, weight loss, increased liver enzyme activity)

Sample/procedure	Test	Evaluation/interpretation
Rectal examination		To identify masses/faecal consistency. Look for parasites on rectal sleeve. May take rectal biopsy for histopathology **(Figure 3)**
Peritoneal fluid	Cytology, cell count, protein concentration and culture	Changes can be seen with non-infectious lesions such as intestinal strangulation. Marked increase in cell count and protein are more consistent with bacterial peritonitis. Culture may be negative – does not rule out bacterial infection
Ultrasound	Abdomen	To identify masses/abscesses; evaluate solid structures, e.g. liver; evaluate colon contents – fluid contents may suggest colitis, even if diarrhoea absent. Increased intestinal wall thickness may suggest enteritis/IBD/neoplasia. **(Figures 4 & 5)** In weanlings, *Lawsonia intracellularis* results in thickened SI wall
Liver biopsy	Histology, culture	Changes may be suggestive of aetiology, e.g. cholangiohepatitis; but are often non-specific. Neutrophilic infiltration may be more suggestive of bacterial cause. Culture recommended, but often unrewarding
Faeces	Culture, faecal egg count, toxin assay	Selective culture for *Salmonella* – require at least three samples. Egg count may be negative with cyathostominosis. Toxin assay for *Clostridium perfringens* and *C. difficile*, if horse has diarrhoea (especially if history of antibiotic administration)
Serum	*S. equi* ELISA	Especially if intra-abdominal abscess identified (metastatic *S. equi*)

Table 4. Signs localised to central nervous system (including mentation changes, ataxia, paresis, hyperaesthesia, cranial nerve abnormalities)

Sample/procedure	Test	Evaluation/interpretation
CSF	Cytology, cell count, protein concentration, culture	Increases in cell count and protein are non-specific for inflammation (viral/bacterial/parasitic). A neutrophilia, or marked increase in cell count and protein, would be more consistent with bacterial infection. Culture often unrewarding
Serum	Antibody levels	EHV levels (see also Respiratory) Depending on geographic location, may test for WNV
Radiographs	Cervical spine, head	Evaluation for possible osteomyelitis that could extend to CNS
MRI/CT		For evaluation of intracranial masses

Table 5. Signs localised to the musculoskeletal system (including lameness, limb swelling, joint swelling –adult horses with localised synovial structure sepsis will not typically have a fever)

Sample/procedure	Test	Evaluation/interpretation
Synovial fluid analysis	Cell count, protein concentration, cytology, culture	Increases in cell count greater than 20,000/µl and protein greater than 40g/l suggest sepsis. Neutrophilic (>80%) cytology suggests bacterial infection. Culture often unrewarding
Radiographs	Of affected limb/joint	To determine bony involvement/osteomyelitis. If acute infection, bony changes may not have yet occurred
Ultrasound	Of affected area	Can be used to assist with identifying sites for sampling culture, e.g. with cellulitis may be identify fluid pocket to aspirate?
Blood	PCR, serology, cytology	*Anaplasma*, *Borrelia*

Table 6. Signs localised to cardiovascular system (including murmur, arrhythmia, signs of cardiac failure)

Sample/procedure	Test	Evaluation/interpretation
Blood	Culture	Multiple samples required to detect bacteraemia
Ultrasound	Echocardiography Vascular scan	In particular, looking for evidence of valve leaflet thickening (endocarditis), myocardial abnormalities (myocarditis) and pericardial effusion. If palpable, abnormality of jugular vein, for example

been imported from Italy and which is showing ataxia, fever, hyperaesthesia and depression, may be infected with West Nile virus (WNV) and should be tested.

Testing for WNV in a horse which comes from a closed yard situated in a country with no evidence of WNV infection, with no history of travel but similar clinical signs would not be appropriate; although haematology, acute phase proteins and CSF analysis may be appropriate to rule out bacterial meningitis. In either case, EHV1 infection could be a differential, and has potential impact not only on the individual horse, but also all in-contact horses, so testing for EHV1 would be appropriate.

5. What, if any, treatment is necessary?
In an ideal world, we would have clients who were happy to pay for whatever diagnostic tests we thought appropriate, and we would have access to tests that would provide rapid results. The reality of the situation, however, is that we are usually forced to make a treatment decision after performing only a physical examination.

The majority of fevers are caused by infectious agents; but determining whether the causative agent is a virus, bacterium or fungus can be more challenging. In addition, even if it is a primary viral disease, a secondary bacterial infection cannot be ruled out. Whether or not to use antibiotics before further diagnostics become available – or even instead of performing diagnostic testing – will be determined by (a) the severity of clinical signs and thus the risk of *not* treating; (b) client finances; (c) logistical considerations, such as when test results will become available and when you will next be able to see the horse.

If antibiotics *are* used, the choice of drug should be based on the most likely bacteria to cause the disease/clinical signs, the available route and frequency of administration (your client may not be happy to give intramuscular injections) and your clinical experience with similar cases.

If no response is seen within three to four days of these first line antibiotics, further diagnostic testing is recommended.

Fever of unknown origin

Fever of unknown origin (FUO) exists when a fever is prolonged and there are no specific signs associated with it. Although these horses can be very frustrating to manage, in the majority of cases, the fever is caused by a common disease with an unusual presentation, and thus, following a logical approach can lead to a diagnosis.

"In an ideal world, we would have clients who were happy to pay for whatever diagnostic tests we thought appropriate"

In a series of 63 cases of FUO (Mair et al, 1989), infection was the cause in 43 per cent, neoplasia in 22 per cent, immune-mediated disease in 6.5 per cent and miscellaneous disease in 19 per cent. In this series, the diagnosis of FUO was based on (a) illness of at least three week's duration associated with non-specific signs; (b) body temperature greater than 38.6°C on several occasions; (c) no clear diagnosis after initial haematology and biochemical testing.

Infectious diseases identified included endocarditis, peritonitis, abdominal abscesses, cholangitis, pyelonephritis and cellulitis. The most commonly identified neoplasm was lymphoma. Immune-mediated disease was diagnosed relatively infrequently, which differs from similar studies in humans and small animals. Whether the latter is because of a truly lower incidence or because of our comparatively limited ability to diagnose immune-mediated conditions in horses, is unknown. Despite extensive diagnostic tests, the cause remained unclear in almost 10 per cent of horses.

Conclusions

In many situations, the cause of a fever in a horse will be relatively clear once a history has been obtained and clinical examination has been performed. Routine haematology and biochemical analysis (including acute phase protein measurement) will typically be supportive of an inflammatory response but in many cases will not identify the source of the fever.

Using a targeted diagnostic approach will help the clinician to pursue the cause of a fever in cases where the reason is not obvious. ■

PPD Questions

1. In equine medicine, a 'fever of unknown origin' has been defined as:

A. A fever for which a reason cannot be identified following a routine clinical examination
B. A fever which occurs secondary to hyperthermia
C. Multiple episodes of fever for which a cause cannot be identified following a routine clinical examination
D. Multiple episodes of fever for which a cause cannot be identified following a routine clinical examination, haematology and biochemical analysis of blood
E. Multiple episodes of fever for which a cause cannot be identified following a routine clinical examination, blood tests, abdominal and thoracic ultrasound and thoracic radiograph

2. Non-steroidal anti-inflammatory drugs are effective in the treatment of fever because they:

A. Block the production of prostaglandins which are produced in response to endogenous pyrogens
B. Block the production of endogenous pyrogens produced by monocytes and macrophages
C. Act to alter the thermoregulatory set point
D. Prevent the interaction of inflammatory cells with cytokines so that endogenous pyrogens are not produced
E. Are not effective in the treatment of fever, only in the treatment of hyperthermia

3. Which statement regarding investigation of a fever is incorrect?

A. *Lawsonia intracellularis* infection can be seen in weanlings with fevers, weight loss and loose faeces
B. Ultrasonographic evaluation of the abdomen is rarely rewarding because the large colon dominates the abdomen and obscures visualisation of the majority of other structures
C. Exposure to *S. equi* can be confirmed utilising an ELISA test providing the blood sample is taken at an appropriate time point after exposure
D. West Nile virus infection has not been recognised in horses in the UK
E. Culture of synovial fluid is often not rewarding even if sepsis is confirmed by a high cell count and protein concentration

4. Which statement regarding equine influenza infection is correct?

A. Clinical signs typically include a purulent nasal discharge, lymphadenopathy and dysphagia, along with a fever
B. A diagnosis can only be made by looking for seroconversion in blood samples taken 10-14 days apart
C. Vaccinated horses do not show clinical signs, but can shed virus and infect other horses
D. Vaccinated horses can show clinical signs, and can shed virus and infect other horses
E. Fever is an uncommon occurrence with equine influenza infection

5. A 6-year-old horse presents with a fever, ventral oedema and weight loss despite a good appetite. Which combination of tests would be most appropriate to perform?

A. Abdominal ultrasound and faecal PCR for *Lawsonia intracellularis* infection
B. Abdominal ultrasound, faecal egg count and complete haematology and biochemistry
C. Gastroscopy and oral examination to rule out gastric ulcers and dental abnormalities
D. Guttural pouch endoscopy, lavage and PCR to rule out 'Bastard' Strangles
E. Exploratory laparotomy to confirm abdominal neoplasia

Answers
1.D 2.A 3.B 4.D 5.B

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Contending with owner expectations

Living up to owner expectations is never easy and it could be argued that equine owners' expectations are some of the highest. This being the case, the equine vet needs to be prepared for what is expected of him or her. This is a serious point, as meeting and – even better – exceeding expectations should be one of the fundamental aims of the profession.

It is, therefore, pertinent to have a few good answers ready for the expectant owner when things maybe do not go according to plan.

Being on time

No vet is deliberately late, but things do get in the way – visits take longer than expected and even with catch-up time, scheduling may still start to slip. The result can be an impatient owner and a harassed vet; so what's the answer? Telephone ahead or ask a member of the practice team to do it for you.

It is the 'not knowing' when the vet will arrive that is the frustration for the owner, not the fact that he or she may be late. It's polite – but also politic – to keep the owner informed and it makes life easier for everyone.

Always knowing what's wrong

It is not always obvious what may be wrong with the patient. Clients tend to assume that the vet is the font of all knowledge and can make an immediate diagnosis. The vet is not omnipotent when it comes to diagnosis and may need to seek help/confirmation with more difficult cases. So it's worth explaining that you are not an expert in every equine field but that you do know whence to source the expertise, if necessary, for a particular case.

Being there for horse and owner

The vet's primary concern is with their animal patient and this is what they need to concentrate on when visiting. They do not need the distraction of an owner's chatter about non-related topics and maintaining a professional approach is key.

However, somewhere within this scenario, the vet does have to maintain a good social rapport with the client if the relationship is to flourish and survive.

Always being available

It is quite natural for owners to want to see the vet of their choice and "the same vet who saw their horse last time". In reality this is not always possible and a client will better understand the position if it is properly explained to them rather than their being left with a vague "Miss Smith is not working today". So maybe from the outset of any relationship with a client the vet should talk through time off and days away from the practice and who else may visit.

It's worth the vet saying too that they will always be there when they possibly can, but that their colleagues are well able to stand in for them while they are having a well-deserved break, or just time off to catch up with other aspects of their life.

Making lots of 'dosh'

The public perception is that vets 'make a lot of money' and, when it comes to salaries, they always compare vets with doctors and dentists. Large vet bills do not help here. While it is impractical to start to explain to every client where the money they spend on vet's fees goes – including numerous overheads and fixed costs as well as salaries – it is worth stating that you are not doing this for the money and that the average veterinary surgeon's salary is not as high as most clients think.

Acknowledging that veterinary care can be costly is fine as long as the point is made gently that it is also costly to actually run a veterinary practice.

Of course we care

Vets may sometimes appear to owners as being rather 'clinical' and 'matter of fact'. This is because they experience highs and lows in the emotional stakes all day, every day; taking a pragmatic view is often the only way to keep these emotions under control.

So the important thing is that vets make sure owners understand this component of their professional approach – yes, they do care a great deal about the animals they treat and that they experience the same emotions as the owner when good or bad diagnoses or prognoses are given.

And finally...

From the veterinary surgeon's point of view, how good it is when their patient is ready and waiting for them when they arrive at the stables, and when all the necessary information about the horse and its problems and current medication is available. It is then that they can do the job they came for and provide quality care and advice for their patient. ■

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Joe Henry
BVMS Cert SHP MRCVS

Joe Henry graduated from Glasgow Veterinary School in 1998 and joined a mixed practice in Alnwick. After five years, he spent a year in New Zealand before returning to the UK and becoming a partner in 2005. In 2007, following a practice merger, he moved 14 miles inland to be based at Rothbury where his day-to-day work and health planning is helping reduce the impact of disease on the sheep and beef farms in the surrounding area.

Joe achieved the Certificate in Sheep Health and Production in 2011, is married with three children and runs a farm comprising 200 ewes and 90 cattle.

**Suggested Personal & Professional Development (PPD)*

PRODUCTION

Improving flock performance by reviewing the production year

When your clients' ewes are pregnant during the winter months, it is a good time to review the flock's overall production performance during the previous year. Helping sheep farming businesses identify losses and reducing them is a big step towards greater profits.

One of the biggest drivers for profit in a sheep flock is output as measured by kilogram of lamb produced per ewe tupped. This is made up of numbers of lambs reared and their weight. To do this, compare last year's scanning results with the numbers of lambs sold and kept for replacements.

Unfortunately, the average lowland flock only rears 145 lambs per 100 ewes in England (EBLEX Stocktake, 2013) despite most 'scanning' near to 200. This figure has not changed much for 30 years and represents a huge opportunity for the veterinary profession to lead their sheep clients to greater production and profit – especially if we consider the comparison of how much the yield per dairy cow has changed in the same 30-year period?

Cornerstones of a health plan

Identifying where conception-to-sale losses occur is one of the cornerstones of a flock health plan. On most farms there is room for improvement and thus an increase in profit.

Ideally, the percentage of lambs sold/kept should be increasing every year. The best farm in our practice reared 184 per cent lambs last year; thereby proving what can be achieved. If their business is not improving, that on other farms will be and so theirs will, in effect, be going backwards.

Getting sheep farmers to measure their performance is the first step. It is easier for the dairy farmer as production is in the tank each day; whereas the sheep or beef farmer has to work harder to extract the information. It *is* there, however, and a great deal of the information has to be recorded as a legal requirement – numbers of lambs moved off farm to sales and when are recorded in the movement book, for instance.

> "Getting sheep farmers to measure their performance is the first step"

Each farm's targets are different; they need to be realistic for that farm and set up in conjunction with the farmer.

Lameness control is vital and impacts all stages of sheep production and should be two per cent or below. If foot rot is the major cause of lameness, implementing a five-point plan can maintain lameness at less than one per cent (Clements R, 2014). Contagious ovine digital dermatitis has been eradicated from flocks with good biosecurity in our practice by flock treatments with tilmicosin.

Know about nutrition and parasites

Before mating, the ewe's body condition score is important with targets being set for tupping – aim for 3.5 in lowland ewes, 3 in upland ewes and 2.5 in hill ewes. These can be measured by the veterinarian when doing pre-tupping trace element blood testing for cobalt, selenium, copper and iodine status. Correct ewe body condition at tupping has a carry-over effect on subsequent weaning weight (EBLEX KPI, 2014) and the only costs are those associated with management. During the ewe's mating period, grass needs to be

plentiful because there should be no weight loss during this time. If grass is in short supply, ewes need to be prioritised, otherwise next year's crop of lambs will be jeopardised.

Supplementary feeding of concentrates can be counter-productive because bullying may occur leading to stress that, in turn, reduces conception levels. Feed blocks or buckets are better but need to be used at the correct number per sheep.

Parasite burdens should be treated appropriately – remembering that fit ewes will not need worming and fluke can have big impacts on scanning if not controlled. All tups should have a pre-breeding examination by the vet. Clearly, genetics also have a big impact on conception rates and need to be matched to the system/farm under consideration.

The lamb losses start in pregnancy with abortions, which should occur in less than one per cent of the flock. If they are greater than this, the cause should be identified and corrected – abortions are often just one end of the spectrum of problems; with stillbirths and weak lambs – which have a high mortality rate – the other outcomes. Some causes of abortion, such as toxoplasmosis, Border disease and tick-borne fever, will also reduce scanning percentage by increasing the barren rate – which should not be more than three per cent in lowland flocks or four per cent in hill flocks.

Nutrition of the ewe prior to lambing is critical with metabolic profile blood samples three weeks before lambing to actually see what the sheep is gaining from the ration. At this point, problems with protein and energy can be countered before too much damage is done in terms of 'twin lamb' disease, poor colostrum quality and milking ability. This is especially important for silage-based rations as it varies from field to field and bale to bale.

The silage and concentrate analysis will give a good guide as to how much to feed; although it is only by sending off bloods for hydroxybutyrate (BOHB), albumin and urea analysis that what the ewes are actually receiving can be measured (**Figure 1**). This is often different to what it is assumed they are getting.

Monitor neonatal disease and mortality rates

At birth, adequate supervision is important, with starvation leading to hypothermia still causing too many deaths. Dystocia should also be recorded to see if there is anything further that can be done in this respect. Neonatal infections should be noted with a target of fewer than three per cent of newborn lambs succumbing to 'watery mouth' or 'joint ill'.

Batch post-mortems of neonatal lambs are useful for demonstrating farm management deficiencies – for instance, checking that lambs born alive but dying within 24 hours are receiving adequate amounts of colostrum. Other conditions, such as ewe lameness, will increase indoor-born lambs being lain on, and these deaths should also be recorded.

Once lambs are over two weeks old, mortality should be very low – below three per cent from now until sale. Clostridial disease, pasteurellosis, gastrointestinal worms, coccidiosis, blowfly strike are all common killers and if clients are unsure of the cause of death then post-mortems should be undertaken by the vet.

"Once lambs are over two weeks old, mortality should be very low"

Figure 1. *The author blood sampling a sheep.*

By recording when and why all these losses are occurring, it is possible for the vet to sit down and work out a preventive flock health plan to allow the farmer to produce more lambs from the same number of ewes.

Set some sensible targets

The other important measure of output is the stage when lambs reach target weight – with goals of 25 per cent away by weaning and 95 per cent by the time the tups go back out which is achieved by many 'terminal sired' lambs. If lamb growth rates are not achieving their targets, this should be identified early when weighing a proportion of lambs prior to drenching or at the time of ectoparasite medication application.

Use of EID tags and automated weighing can allow this to be measured much more easily. If lambs are not averaging 250g/day before weaning, then the causes of this need to be investigated. Slow lamb growth also costs farmers money because they sell fewer lambs while prices are higher early in 'the season'.

Gastrointestinal worms are the major cause of poor growth rates in lambs, often owing to ineffective control because of unrecognised anthelmintic resistance (AR). All sheep farms should know their AR status by performing faecal egg count reduction tests. This can be a real 'in' to getting the farmer on board with health planning and does not cost a lot to do.

Thirty-eight per cent of farms sampled for the South West Healthy Livestock Initiative had some level of resistance to all three of the older anthelmintic groups. If we do not change the way sheep farmers use anthelmintics and look at management changes to reduce the need for anthelmintics, then many sheep farms will not have a viable future. Vets must be familiar with the Sustainable

"Grazing quality, coccidiosis, lameness and trace element deficiencies are all causes of poor growth rates"

Control of Parasites in Sheep (SCOPS) principles and spread the message whenever possible.

Grazing quality, coccidiosis, lameness and trace element deficiencies are all causes of poor growth rates. This season we have seen many more low vitamin B_{12} levels than normal. Remember when blood sampling for B_{12} the sheep must have only been in the pens for a couple of hours at most as stress falsely elevates the levels leading to misdiagnosis.

There is no store of B_{12} in sheep, so supplementation should be continuous, through boluses or a long-acting cobalt injection – our practice imports and distributes a product from New Zealand called Smartshot B_{12}. Short-acting supplements (drenches need to be repeated at least every three weeks) are seldom repeated frequently enough to be effective.

If deficiencies are corrected in mid-season, then it will cost the farming business far less than waiting until lambs are below target in the autumn when grass quality is declining, parasite burden is increasing and expensive supplemental feed has to be used.

Ewe mortality is another figure that is easily obtained from the records and should be below five per cent. If not, find out when and how these losses are occurring as some of the 'slow' diseases such as Maedi Visna, ovine pulmonary adenomatosis (Jaagsiekte) or Johne's disease will all add to the mortality rates, and once they become established can be difficult to reduce. ■

PPD Questions

1. What was the average rearing % of lowland ewes in England last year?
2. What is an 'acceptable' percentage of lame sheep?
3. What is the target body condition score for a lowland ewe at tupping?
4. Over what percentage should abortions be investigated?
5. What is the biggest cause of under-performing growth rates in lambs and why is this?

Answers
1. 145
2. 2% or below
3. 3.5
4. 1%
5. Parasitic gastroenteritis and ineffective anthelmintic usage through not knowing AR status

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Owen is a dairy vet who had 20 years of experience in clinical farm practice before establishing Dairy Veterinary Consultancy Ltd based in Cheshire. He works throughout the UK (and occasionally overseas) providing strategic health advice and training to the dairy industry, and offering a second-opinion and referral service for vet practices. His focus is on success factors, cow health and welfare, and sustainability.

Owen is an RCVS Diplomate in Cattle Health and Production, and a CowSignals master trainer. He has particular professional interests in lameness reduction, rumen health and housing design.

*Suggested Personal & Professional Development (PPD)

BEHAVIOUR

Time for a common sense approach to dairy cow behaviour

Dairy cows, as is the case with most domesticated animals, have evolved from their ancestors to become quite different creatures; but their behavioural characteristics and social needs are in part 'hard-wired' by their DNA. It is useful to keep in mind what is 'normal' for cows and understand their natural behaviour, so that we can ensure their psychological and physiological well-being.

This article discusses some of the behavioural characteristics of domesticated dairy cows kept in various systems, and compares these against what might be 'normal.

The auroch

The auroch is an extinct type of wild cattle and is the direct ancestor of domesticated cattle. The species survived in Europe until the last recorded aurochs died in 1627. Domestication of aurochs gave rise to the *Bos indicus* species (zebu-type cattle) and the *Bos taurus* (European cows). Whilst aurochs, sadly, are extinct, they share some resemblance to more 'primitive' breeds of European cattle – Spanish fighting bulls, for example.

Towards the end of the Pleistocene Era, grasslands and tundras favoured large grazing animals. Aurochs were among those species that thrived. By around 6,000 years BC, it is thought human populations in the Middle and Far East had begun to domesticate some of these cattle, herding small numbers. The consistent provision of dung for fuel and milk for drinking would have had distinct advantages over simply hunting wild animals (for meat, skins and bones).

While we keep dairy cows in quite different conditions to the extensive grazing herds of the aurochs, we can look to them to simply ask "what do you need from us?" to help mimic their intrinsic behavioural requirements. So it is worth exploring what we understand to be some key features of the auroch's natural history:

- Herd animals, forming unisexual herds of 30-40 animals
- Seasonal breeders – spring calving, and cycling only if the nutritional status was good
- Adult bulls roaming in singles, fighting aggressively for dominance and the right to breed, detecting females in oestrus using the 'flehmen' response to pheromones
- Calves staying with – and protected by – dams until six to 12 months old, corralled into the centre of the herd for protection
- Prey animals – remaining constantly alert with acute senses of smell, sight and hearing, sleeping only rarely
- Grazing animals – converting rough forages into volatile fatty acids and microbial proteins by the process of rumen fermentation. Feeding little and often, following a repeating pattern of standing to eat and lying to ruminate ('cud'), in synchrony with herd mates
- Roaming animals, grazing large areas using smell to find fresh pastures
- Hierarchical animals, adults and youngsters establishing their dominance by head-to-head behaviours, so that in times of food shortage, the dominant animals would access the best grazing
- Main predators were wolves, hyenas and big cats (as well as human hunters) – aurochs required an ability to run away fast, and not show signs of pain or weakness. This stoicism is important when considering detecting lameness – farmers often only notice lame cows once hoof lesions are very severe. The DairyCo mobility scoring system helps observers to detect earlier signs of lameness for quicker treatments.

Figure 1. *A housed environment can provide some advantages – for example, a better food supply to meet the nutritional demands of high yielding cows – but the design must be excellent to meet their social and resting needs too. These cows display excellent grooming, eating and lying behaviour, indicative of a contented herd.*

The modern cow

Dairy cows work at three to four times their maintenance requirements, a level of work rarely achieved by humans, and only when they are operating at extremes – Tour de France cyclists, for instance, or 'Ironman' triathletes. Making milk is hard work, requiring a high metabolic rate and excellent nutrient supply. Inevitably, the higher milk production of domesticated dairy cows means they live on a physiological knife-edge, and with very large requirements for nutrients.

In practice, this means that two approaches are taken on farms: a reduction in milk demands, as practised by lower input, extended grazing herds; or a more intensive feeding and management regimen to meet the cows' requirements, as seen in housed herds fed a higher concentrate diet.

Both systems have their particular challenges.

Grazing systems

To be successful, grazing systems require very close management of grass growth and pasture availability, to match milk yield. An extensive network of paddocks is needed, accessed by good quality tracks and each with its own fresh water supply.

Fertility management is focused towards the delivery of one calf per cow being born at the same time each year. Farms must have a milk contract which allows a seasonal production and, perhaps above all, a type of cow that does not have a tendency to produce too much milk at the expense of her own body condition.

Housed systems

In contrast, the higher yielding system, exemplified by housed Holstein herds, generally have all-year calving patterns, and farms have a level milk production. The cows rely to a far greater extent on purchased feeds and 'concentrates', as forage alone can never be eaten in sufficient quantities to provide all their nutrients. This can mean the rumen is challenged by excessively rapid fermentation and fast transit times.

Cows like the taste of concentrates, and will generally eat them in preference to forage; they can also eat a large quantity of concentrate and processed forage very quickly, because it does not have to be grazed and the lower moisture content means high amounts can soon be 'hoovered' up. It is better for the rumen, however, if feeding is spread through the day in as many feeds as possible.

Housed cows can potentially live in a more controlled environment; but, as they are indoors or in confined areas, space can become a scarce resource. Lack of space will affect social behaviour and feeding bouts, as well as making manure management more difficult. To maximise space efficiency in housed cows, and ensure hygiene for the udder, designated lying areas are used – typically cubicles. These are, of course, entirely unnatural for a cow, and can affect resting behaviour, both in number of lying bouts and total lying time, exacerbated by poor cubicle comfort (**Figures 1 & 2**).

Housed herds are often milked three times a day, and robotic systems (voluntary milking systems) create even greater opportunities. Increasing milking frequency not only raises production, but can reduce the risk of mastitis and, potentially, the discomfort of very full udders. It more closely mimics nature.

All systems

It is important to remember that some challenges are the same, irrespective of the dairy system. For example, social hierarchies in any system can be complicated by large herd sizes and group changes. Infectious disease is a risk, particularly where movement of animals between herds occurs, and removal of calves at or soon after birth is a necessary – but 'unnatural' – part of dairy farming.

Figure 2. *Here there are too many cows standing and not eating. If it is not a consequence of human disturbance, this might indicate poor cubicle comfort, overcrowding, or not enough fresh air (poor heat abatement strategy). The cow at the top right is displaying fresh air seeking behaviour.*

Maximising feed intakes is important for production success – for grazers, this means the pasture characteristics must always be right, and for housed cows, the presentation and quality of the diet is important.

Getting cows in calf is one of dairy farmers' challenges. Until dairy farmers develop their own flehmen response, they are generally dependent on inferior methods of oestrous detection. Cyclicity of cows may be sub-optimal while her milk output remains unnaturally high, and her body responds to the efflux of nutrients.

Time budgets

The 'time budget' concept comes from the USA, where dairy cows are housed and husbandry is more consistent than the mixed grazing/housed systems predominant in the UK. Without the right environment, cows will budget the time they spend resting, feeding and ruminating ineffectively, leading to a greater departure from their natural behaviours, decreased productivity and more ill health.

It is not only the total length of time a cow spends doing each activity that is important, but the number of bouts too. For example, although a housed cow might spend a total of five hours eating, if this is in only two or three main bouts, the health of the rumen will be compromised. Little and often is best.

Resting behaviour is important – cows should eat-lie-repeat. Rumination occupies a huge amount of time for a cow – typically eight to 10 hours per day – and this should be done while lying down. Not only is this better for the cow's feet (taking weight off them, and allowing them to dry out), but lying allows better blood flow to the udder and potentially increases efficiency of milk production.

Although it is widely stated that each extra hour lying time (up to a maximum of around 12 hours) allows a cow to produce a further litre of milk, recent research shows a more complex relationship between milk yield and lying times – for example, it is influenced by stocking rates and the fact

that higher yielding cows tend to spend more time eating (Norring et al, 2012).

By observing cows at grass, it becomes clear that they spend their time either standing and eating, or lying down, mainly cudding. Usually, these activities will be in synchrony as a herd. By contrast, cubicle-housed cows can often be seen 'loafing' in alleyways or cubicles, possibly cudding, but standing nevertheless. A rule of thumb is for no more than 15 per cent of a herd to be doing anything other than standing eating, or lying down (**Figure 3**). Of those lying down, 80 per cent should be cudding.

Cows standing but not eating are sometimes referred to as 'waiting cows', because they are waiting to do something different – either to find a comfortable place to lie down, or to go to the feed barrier to eat. Waiting cows often show 'intention movements', which are physical 'tells' that they want to do something different.

Common examples of intention movements are head weaving in a cubicle, or half steps forwards in a passageway, or perhaps failed attempts to lie down or reverse out of a cubicle. Poor cubicle comfort, overcrowding and poor shed design all lead to more waiting cows.

Time budget studies

A recent UK study (Atkinson, 2014) of a housed Jersey herd milked through a voluntary milking system used time lapse photography to establish the detailed time budget of a cow. The results are shown in **Table 1**.

It is interesting too to look at a summary of the time budget of the individual cow observed in the study:

- Eating for five hours, in nine bouts (median bout length 0.5 hours). Feed was pushed up by a robot every hour in this study
- 13 hours in a cubicle, of which 12.5 was spent lying down, in six bouts (bout range 15 minutes to four hours; median 2.5 hours). Most of lying time was spent cudding. Observed sleeping for a total of 21 minutes in several short bouts
- Five hours loafing, grooming and socialising. Half of this time was spent around the automatic milking stations, possibly waiting for feed. A small amount of 'waiting' time was observed as she appeared to wait for a preferred cubicle
- A significant amount of loafing time was spent displaying head-to-head activity with herd mates, presumably to establish hierarchy: 30 minutes in seven bouts

Given the generous space allowance and good design of the shed in this study, it is likely that the lying and feeding times and bout numbers observed are higher than might be expected in other housed UK dairy herds. The limitations of the study should be emphasised – a single cow on a single day in a single herd.

Figure 3. *Cows either stand and eat, or lie down to chew their cud. Cows standing to chew the cud is abnormal, and as a rule of thumb, when observing housed cows, no more than 15 per cent of the herd should be standing but not eating.*

Such a detailed time budget and time line has rarely been established in UK housed cows; the results are comparable to previous north American studies – for example, Ito et al (2009) found cows lay down for a mean of 11 hours/day in nine bouts, but with very large individual variation. Lying times and the number of bouts are likely to have influences on production as well as cow health; in turn, cow health, such as lameness, affects lying behaviour (Cook et al, 2007).

Rioja-Lang (2009) gives a detailed review of feeding patterns in housed dairy cows, but individual feeding bouts are defined differently in different studies. De Vries et al (2003) examined the normal feeding pattern of cubicle-housed lactating cows and found they consumed an average of 7.3 meals per day, spending a total of six hours at the feed face.

Rioja-Long (2009) comments that the number and length of feeding bouts will vary between individuals depending on their age, stage of lactation and position

Table 1. Time budget for a 24-hour period (%)

Activity	Total minutes doing activity (hours)	Number of bouts	Median length of bout	Mean length of bout	Maximum length of bout	Minimum length of bout
Lying in cubicle	741.5 (12.3)	6	160	124	236	15
Standing in cubicle	33	13	1	2.5	6	0.5
Loafing around robot	143 (2.4)	11	8	13	39	0.5
Milking	16.5	3	5.5	5.5	6	5
Loafing/waiting in alleys	100.5 (1.7)	16	7	14	25	1
Purposeful walking (a to b)	36	19	1	1.9	5	0.5
Grooming	15	9	-	1.6	-	-
Socialisation & establishing hierarchy	32.5	7	5	4.6	10	1
Feeding	299.5 (5)	9	34	33	67	12
Drinking	22.5	6	3.5	3.75	10	1
Urinating	4	6	-	-	-	-
Defaecating	3	5	-	-	-	-

within the dominance hierarchy, with the average number of meals varying in the range of around six to eight per day. Lame cows, for example, might go to the feed face less often, but have larger meals – this is detrimental to rumen health.

While many studies have observed feeding behaviour in housed cattle, few contemporary studies describe the normal feeding and lying behaviours of dairy cows in a grazing situation. Phillips and Denne (1988) recorded cows grazing for between six to nine hours in a 24-hour period, spilt between approximately 12 equal grazing bouts – although there is probably much variation depending on breed, pasture characteristics, environment and day length (Phillips and Leaver, 1987).

Cows are best adapted to 'trickle feeding' with many equal meals spread through the day allowing both high intakes while safeguarding rumen health by allowing a more stable pH environment.

Summary

When we meet the basic needs of dairy cows, they repay us with good health, long lives and plentiful milk production. Humans have a long association with domestication of cattle, but in the modern world most of society is far removed from these wonderful animals. Those of us responsible for the husbandry of cows must demonstrate a deep understanding and respect for their needs, so we can earn the respect of the consumer and continue to farm efficiently, and ethically. ■

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PPD Questions

1. When walking into a cubicle shed of lactating cows, which of the following assessments are useful?

   A. Check that there is one feed space per cow – a minimum of 65-70cm per cow
   B. Check that there are no more than 15% of the herd standing, not eating
   C. Check that of cows lying down, at least 80% are ruminating
   D. Check that of cows in contact with a cubicle, at least 85% are lying down
   E. Check that when a cow enters a cubicle, she takes under one minute to lie down

2. A 'waiting cow' is best described as:

   A. A cow that is waiting to be milked
   B. A cow that is waiting for a cubicle to become free
   C. A cow that shows intention movements
   D. A cow waiting to lie down or go to eat
   E. A cow displaying abnormal behaviour as she is unable or not confident enough to do the thing she'd like

3. Space is important in a shed because cows:

   A. Require at least one lying space per cow
   B. Require at least one feeding space per cow
   C. Require sufficient space to be able to evade conflicts
   D. Require sufficient space to display grooming and oestrous behaviour
   E. Produce a lot of faeces and urine, which in confined space accumulates to a greater degree

Answers

1. All are correct
2. Answer (E), but none are incorrect. Most waiting cows are waiting either to lie down or go to eat, as these are the two activities which cows prefer to spend most of their day doing
3. All are correct. Although there is no set minimum space allowance for dairy cows in cubicle sheds, a rule of thumb is at least 10m² per cow, including lying area. Typical UK cubicle houses have only 7-8m² per cow. Space layout is also important – for example, having no dead end passageways and reducing congestion at high traffic areas. Calculating total area per cow in a cubicle shed is very easy, and a good starting point for vets interested in building design and good cow management.

On knowing the **price of everything** and the **value of nothing**

There are 10,000 dairy producers in the UK and over 400 of them quit the dairy business during 2014 compared with 200 the previous year.

This was just one of the stark facts presented to the Environment, Food and Rural Affairs Committee on 25 November last year.

Emphasising the point, chairman of Farmers For Action, David Handley, told MPs: "The situation is getting so serious that in the last nine weeks we've passed three individual dairy producers on to the Samaritans because they were in such a desperate state."

Farmers who were receiving 33 pence for a litre of milk in the spring of 2013, found themselves receiving only 27 pence by the end of the year yet still faced costs of production of just over 30 pence per litre.

And with competing supermarkets selling milk as a 'loss leader' at 40 pence per litre – or less – there would not appear to be much scope for putting things right – other than charging a realistic price to consumers for the milk produced on UK farms and reducing the volume of cheap milk being imported from outside the UK.

This situation highlights two worrying trends that affect not only the dairy industry, but farming in all sectors – the fact that the UK is becoming less and less self-sufficient in its food production, and the fact that consumers no longer appreciate the value of the food they eat.

With the centenary of World War I upon us, there is a plethora of books around at the moment dealing with different aspects of that Great War – its geopolitical background, the devastating battles and, perhaps most interestingly, the lives of ordinary people left back home. Several authors speak of the widespread poverty, especially in rural areas, and the constant pressures on households to be able to afford to eat.

Thus, in 1914, the cost-of-living index showed that an average working class family spent 60 per cent of its income on food, 16 per cent on rent and rates, and 12 per cent on clothing. However, subsequent 20th century price surveys reflect a significant increase in disposable income, the advent of consumerism and the pace of technological change.

By the 1950s, about a third of income was spent on food; by 1994 this had halved again to around 14 per cent – with seven per cent on alcohol; 14 per cent on motoring; 12 per cent on leisure goods and services; 12 per cent on household goods and services. In 1914, all these items were crammed into the four per cent of the index dealing with 'other items'!

The latest Office for National Statistics data (2013) show an even greater decline in the proportion of household budgets spent on food – now down to 11.6 per cent; with the largest expenditure categories being housing (excluding mortgages) fuel and power, transport, and recreation and culture.

This is a dangerous trend. We live on an island and the more that we come to rely on outside sources to supply our food, the more vulnerable we are to external threats to that supply. Cheap meat, milk and other foods (often of poor quality and produced under less than desirable conditions) imported under the guise of the much-vaunted global market may help supermarkets maintain low prices in the short term; but it is a short-sighted approach.

It only serves to perpetuate consumer perception that staple foods are a fundamental 'given', that their supply is secure, and that UK farmers have a good life living in some rural idyll. How wrong can they be?

We must do all we can to encourage consumers – that's our clients, as well as ourselves – to smell the coffee and to start putting real value on the vital things in life. By paying a realistic price for our food, we could become self-sufficient again, while at the same time supporting our farmers – who not only produce food but also maintain our countryside.

Oscar Wilde, in his play *Lady Windermere's Fan*, defined a cynic as 'A man who knows the price of everything and the value of nothing'. Perhaps it is time we abandoned our cynicism with respect to the price of food for a dose of reality as to its value? ■

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**Suggested Personal & Professional Development (PPD)*

AVIAN SURGERY

Common surgical procedures in birds

This article describes three surgical procedures that are carried out regularly in an avian practice. Avian veterinarians are required to perform a wide variety of 'surgeries', but these three conditions crop up (pun intended!) on a regular basis.

Ingluviotomy

Surgical ingluviotomy can be performed for a number of reasons in a wide range of avian species **(Figure 1)**. Common indications include:

- Foreign body removal/crop impaction/sour crop
- Obtaining crop biopsy – investigating suspect proventricular dilatation disease
- repair of damage resulting trauma
- barbed wire injuries in raptors and wildlife
- crop burns in hand-reared parrots
- crop rupture following a flying accident

Typically, ingluviotomy is performed under general anaesthetic. Where a risk of regurgitation and subsequent aspiration is present ('sour crop'/crop impaction) the bird should be anaesthetised with its head elevated and the pharynx packed with swabs. Patients should be intubated.

Birds are positioned in dorsal recumbency and an area of feathers plucked along the midline just cranial to the sternum. Plucking feathers is painful for the bird – and the anaesthetist should be warned prior to plucking. The adjacent feathers should be taped out of the surgical field. A skin prep with povidone/iodine (or similar surgical prep solution) can be used to sterilise the surgical field.

> "Lightweight, plastic, translucent drapes are best for avian patients. The bird should be draped and a fenestration cut over the incision site"

Lightweight, plastic, translucent drapes are best for avian patients. The bird should be draped and a fenestration cut over the incision site. Curved haemostats or a cotton tip applicator can be inserted via the mouth into the crop and carefully elevated to mark the incision site. An incision is made through the skin, taking care not to incise the crop at this stage.

In most cases, stay sutures should be placed in the crop and an incision made, carefully avoiding the large blood vessels that are present in the crop wall. In cases of suspected proventricular dilatation disease (PDD), a blood vessel should be included in the biopsy.

In cases of crop stasis or sour crop, the contents of the crop should be removed. The technique used will depend on the consistency of the contents, but suction, sterile teaspoon and forceps can be utilised. Care should be taken not to damage the thin crop wall or to contaminate the surrounding soft tissues (**Figure 2**).

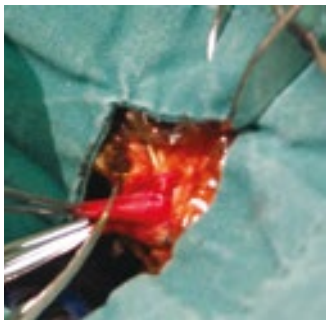
The crop should be closed using a monofilament suture material. Research has shown that less tissue reaction occurs when polydioxanone. My preference is to use Monocryl (Ethicon).

A continuous inverting suture pattern – Connell, for instance – is used in two layers to create a tight seal. In very small patients, an appositional suture pattern may be required to prevent restricting the crop volume. The skin can then be closed.

Delayed closure can be performed in very sick raptors with sour crop. In this condition, the rotting meat in the crop causes toxic shock in the patient; so to reduce initial surgery time, it is possible to perform ingluviotomy – remove the toxic crop contents and recover the bird without closing the surgical site. A delayed primary closure of the crop and skin following stabilisation of the bird – correcting dehydration, acid/base imbalances, shock – can be performed 12 to 24 hours after the initial surgery.

Figure 1. *Buzzard with severe sour crop.*

Figure 2. *Obtaining a crop biopsy from a grey parrot with suspected PDD.*



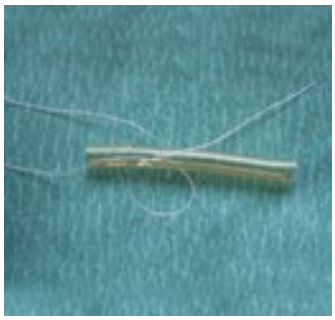


Figure 3. *Prepared air sac cannula with pre-placed sutures.*

Figure 4. *Cadaver specimen showing site of air sac breathing cannula.*

Figure 5. *Air sac breathing cannula inserted.*

Figure 6. *Anaesthesia being maintained via air-sac breathing cannula.*

Placement of an air sac breathing tube

This is a truly life-saving procedure which all avian clinicians should be able to perform swiftly and efficiently in an emergency situation. Practising this procedure on cadaver specimens prior to an actual emergency will ensure confidence with the technique. Indications for air sac cannulation include:

- Pharyngeal/laryngeal obstruction
- Tracheal/syringeal obstruction
  - fungal granuloma
  - inhaled foreign body
  - tracheal stricture
- Surgery of the head/neck

A short period of general anaesthesia will be required.

Have ready, a sterilised air sac tube – the diameter should be 25 per cent larger than the patient's trachea. The section of tube which will enter the air sac should be no longer than one-third of the width of the patient's coelom at the level of the last rib. Sutures should be pre-placed (**Figure 3**).

Unless pathology dictates otherwise, use the left caudal thoracic air sac which is larger than the right.

The anaesthetised bird should be placed in right lateral recumbency, the wing is abducted dorsally and the legs retracted caudally. The last rib is located – access is either between the 7th and 8th rib, at a level one-third from the top of the rib, or caudal to the 8th (last) rib. The skin should be sterilised and, following an initial skin incision, use blunt dissection to access the caudal thoracic air sac via the intercostal muscles (**Figure 4**).

Place your tube into the air sac (**Figure 5**). Occlude the tube while it is sutured in place. One suture should encircle the last rib to prevent the tube migrating from the air sac. If anaesthesia is to be maintained, then attach the anaesthetic circuit and reduce flow rate to 300ml/kg/minute (**Figure 6**).

This will stabilise the patient sufficiently so that diagnostics/treatment can be performed. It is important to remember that a bird's respiratory function will often improve dramatically under anaesthetic because its fear and stress have been relieved.

Figure 7. *Class III pododermatitis, secondary to talon penetration.*

Surgical treatment of pododermatitis in raptors

Pododermatitis ('bumblefoot') is a condition recognised as an inflammatory – and typically infected – lesion of the plantar aspect of the foot, affecting either the ball of the foot or one or more toes. Bumblefoot is a common disease in large species of raptors (particularly falcons) maintained in captivity.

Raptors' feet are protected by a thick layer of stratified squamous epithelium, which in turn is covered by a layer of keratin. On the plantar surface is a covering of hard papillae. These are thought to help disperse the pressure of the weight bearing on the foot.

Aetiology

Bumblefoot is attributed to one of two main aetiologies. First, any penetration of the foot – by a talon, thorn or other sharp foreign body, or an abrasive object – may introduce infection into the dermis or subdermal tissues (**Figure 7**).

Secondly – and far more commonly – captive birds, may suffer from an avascular necrosis of the plantar aspect of the ball of the foot or a toe. This is a consequence of enforced use of unsuitable perches, or the result of prolonged periods of inactivity, during which time they are taking excessive weight on their feet. Such an area of avascular necrosis causes failure of the normal epidermal defence mechanisms, facilitating the migration of pathogenic bacteria through the skin.

Pododermatitis cases are generally classified into one of five categories (**Figure 8**).

Clinical management

If cases can be detected at Class I stage, then nearly all

- **Class I**
Early devitalisation of a prominent plantar area without disruption of the epithelial barrier – ischaemic necrosis or early callous formation.

- **Class II**
Localised inflammation/infection of underlying tissues in direct contact with devitalised area, with no gross swelling.

- **Class III**
More generalised infection with gross inflammatory swelling of underlying tissues. The origin may be puncture wounds or ischaemic necrosis; by this stage, however, the initial cause is of minor significance in comparison with the gross ongoing pathology.

- **Class IV**
Established infection with gross swelling and involvement of deeper vital structures. Radiology and surgical exploration will often be required to differentiate types III from IV. Class IV is a chronic condition causing tenosynovitis and, occasionally arthritis and osteomyelitis.

- **Class V**
An extension of Class IV and is characterised by crippling deformities – such cases have previously been considered to be inoperable and best euthanised without treatment.

Figure 8. Classification of pododermatitis.

will immediately respond to conservative therapy. It is important to remember that bumblefoot is a preventable disease, most often caused by husbandry deficiencies. No matter at what stage a case is diagnosed, if the underlying husbandry cause is not addressed, the problem will inevitably recur.

Every case of bumblefoot should be classified and the appropriate investigative procedures should be carried out. These are:
- Microbiology
- Radiology/CT examination
- Surgical investigation

Where possible, swabs should be taken for bacteriology and sensitivity testing prior to surgery.

Fibrotic reaction after surgery can encapsulate infective organisms within three to five days of surgery (Cooper, 1978). If sensitivity testing is carried out at the time of surgery, the results may not be available in time to be effective prior to fibrotic encapsulation of infective organisms. Empirical antimicrobials – co-amoxiclav, marbofloxacin, for example – can then be administered pre-operatively while awaiting culture and sensitivity.

> "The aim of surgery is to reduce the antigen loading and, where possible, completely remove infected and fibrotic tissue"

Surgery

The aim of surgery is to reduce the antigen loading and, where possible, completely remove infected and fibrotic tissue. When this is achieved, a necrotic infected area can be converted into a clean, vascular surgical site that may be closed to heal by primary intention.

The skin is carefully prepared to remove any bacterial contamination. **Figure 9** shows a device for restraining feet during bumblefoot surgery. A tourniquet is applied to the leg for a minimal period during surgery to allow a blood-free surgical field. The bird is placed in lateral or dorsal recumbency, with the talons extended by a stationary device as described by Remple (1993) **(Figure 10)**.

The initial incision should include all devitalised or ischaemic areas of the plantar aspect of the foot. The direction and size of the initial incision will take into account directions of tension and the requirement for normal post-surgical function. All fibrotic, ischaemic, necrotic, exudative and caseous material is removed, with particular care being given to avoiding tendons and vessels (**Figure 11**). All surrounding tissues are debrided.

In some cases of Class III (often depending on the isolated bacterial organism) and the majority of Class IV and Class V pododermatitis, prior to closure of the wound, cavities are explored between phalanges 1 and 2, between 2 and 3 and on the lateral aspect of the foot between phalanges 3 and 4 (in a position above the plantar surface, over which the 'jessie' cannot rub).

Into each of these cavities, an antibiotic-impregnated polymethyl methacrylate (AIPMMA) bead is placed (as described by Remple and Forbes, 1998). These beads will continue to release antibiotics into the local area surrounding the previously infected tissue for a period of months. They may be left *in situ* – but later removal is often preferable. The beads' positioning allows them to be removed from the dorsal aspect of the foot.

Following full assessment of IV and V cases, it may be considered that first degree healing is not practical. Such a decision will be based upon the bacterial isolate and the degree of tissue damage and ischaemia. In such cases the wound edges are drawn

Figure 9. *Device for restraining feet during bumblefoot surgery.*

Figure 10. *Osteomyelitis and bone lysis in Class V pododermatitis.*

Figure 11. *Fibrotic and caseous material excised with pyogenic membrane in Class III pododermatitis.*

together, (trapping AIPMMA beads inside) – often using a purse string suture – but are not closed. Topical wound management using a combination of antibiotics, anti-inflammatories and disinfectants (F10SC, for instance) can be utilised.

Following surgery it is imperative that pressure is relieved from the plantar foot. In a normal stance, the total body weight is applied to this particular area. In recent years, a number of different systems have been advocated – in essence a soft, pressure-sparing dressing that achieves weight bearing around the periphery of the foot (away from the ball) is required.

We find yoga matting a very useful product in raptors (**Figure 12**). Different materials and thickness will be required depending on the species being treated. The dressings will require changing every seven to 10 days. Raptors will require their food to be cut into manageable pieces.

The progress of wound healing is assessed when the dressings are changed. In severe cases, repeat surgeries may be required. Dressings can be removed when the surgical wounds have fully healed – although absorbable suture material (such as Monocryl) is often used. Sutures are removed in seven to 10 days in most cases. ■

Figure 12. *Pressure-relieving foam pad formed from yoga type matting. This is held in place using a cohesive dressing, such as Vet Wrap.*

PPD Questions

1. A grey parrot with severe dyspnoea and voice change is presented during a busy evening of consulting. Do you:

   A. Place it on oxygen while you complete the rest of the evening consults
   B. Place it on oxygen while you take a full and detailed history
   C. Restrain the bird to enable you to perform a full clinical examination
   D. Immediately place an air sac breathing cannula

2. Wild raptors with pododermatitis commonly present to veterinarians.

   True or false?

3. A six-month-old Harris hawk presents to the practice during morning consults. The birds is lethargic, weak and has severe halitosis. During a clinical examination you palpate a distended crop. The falconer reports the bird was last fed some rabbit yesterday evening after the bird's first successful hunt. Do you:

   A. Give an injection of metoclopramide, start IVFT and monitor the bird's progress over the next 3-4 hours
   B. Advise the falconer to gavage some saline into the crop to soften the contents and re-check tomorrow, if not resolved
   C. Perform surgical ingluviotomy to enable removal of the crop contents

Answers
1.D 2.False 3.C

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'Happy' pets

There has been much in the veterinary media recently about the keeping of pets, particularly exotics. The rabbit – which was once considered an 'exotic' in the small animal veterinary world – has come into the spotlight as a result of a recent BVA survey, which revealed that one in five veterinary surgeons in Britain is now concerned about welfare aspects of rabbits being kept as pets.

"There is a common perception among the public that rabbits are easy creatures to care for"

In the 'Voice of the Veterinary Profession' survey, companion animal vets were asked about what types of pets the general public should be discouraged from keeping – and rabbits were high on the list. Twenty-two per cent of respondents said that people should be discouraged from keeping rabbits unless they could look after them properly.

There is a common perception among the public that rabbits are easy creatures to care for; in reality they have complex social and husbandry needs. They are highly social creatures and one of the major concerns expressed by the surveyed vets was about individual rabbits being kept on their own, when we know that isolation causes them to experience frustration, fear and boredom.

There was an overwhelming view that rabbits should *not* be kept alone in hutches for 23 hours a day, and that they are often bought for children who soon grow bored with them and leave them neglected for the rest of what can be a relatively long life. A recent PDSA Animal Wellbeing (PAW) report stated that in 2013, 65 per cent of pet rabbits were living alone – so this is a widespread and significant problem.

What makes a pet 'happy'? The sad fact is, that while most owners would consider that they are caring well for their pet, many of them – through their lack of knowledge and the unintentional consequence of their actions – actually create an 'unhappy' pet.

The 'duty of care' introduced by The Animal Welfare Act of 2006 in England and Wales and The Animal Health and Welfare (Scotland) Act 2006 means that by law animal owners must not only prevent their animals from suffering, but must also provide them with the things they need to keep them healthy and 'happy'.

'Happiness' may be difficult to quantify; but suffering is less so and can be assessed by referring to well-being and the RSPCA's Five Welfare Needs - rspca.org.uk/education

Commenting on the BVA survey, Robin Hargreaves, outgoing BVA president and small animal vet, said: "Pet owners, particularly parents trying to buy a suitable pet for their child, have the very best intentions. But I would urge them to stop, think and ask before purchasing any animal, and give careful consideration to their ability to fully provide for its welfare needs."

He recommended that potential rabbit owners did their research first by asking their vet for advice and by reading through helpful documents such as the Animal Welfare Foundation's free *Caring For Rabbits* leaflet.

Clients do rely heavily on veterinary advice and there should be a strong onus on the veterinary professions to provide as much guidance as possible, not just about rabbit care, but on all aspects of animal welfare.

This can be done not only in the surgery, but also through the use of the many leaflets and other educational materials available from veterinary professional bodies, species associations, welfare charities and pet care companies. There is particular merit in posting such advice and information on practice websites and including it in the marketing and social media programmes they set up.

We all remember the power of the 'A dog is not just for Christmas' poster. Perhaps we should be running similar campaigns for other species in order to ensure more 'happy' pets? ■

Be the **first to know...**

Mark Williamson

Mark Williamson is the sales and marketing director for PH Media Group, an international provider of audio branding services. Mark has 10 years of experience advising businesses on how best to implement 'on-hold' marketing and design an audio brand.

'On-hold' marketing

Time spent on hold is largely viewed as an inconvenience by consumers. Horror stories about hours spent in automated queues often find their way into the news but it does not need to be a negative experience.

Although veterinary surgeries will endeavour to answer every telephone query within a matter of seconds, inevitably this won't always be possible. On those occasions when customers need to be put on hold, even for less than a minute, it is essential to create a positive experience that prevents them from hanging up and even instils a good brand image in their memory.

> "Even those surgeries that do use 'on-hold' messaging tend not to harness its power as a marketing tool"

One way to do this is through 'on-hold' marketing, which involves the creation of tailored audio messages that are played to customers whenever they are put on hold or transferred. These messages communicate information about the business and its offers and services, using brand-congruent voice and music. Research has shown it reduces 'hang-ups' by 79 per cent, yet take-up in the veterinary profession remains low.

A waiting game

There are several reasons why veterinary take-up has been low – among them the emergency nature of veterinary work and a desire to be seen as particularly customer friendly. These reservations, however, are grounded in a belief of hold time as an annoyance, during which customers are left waiting in silence or listening to poor quality music.

Even those surgeries that do use 'on-hold' messaging tend not to harness its power as a marketing tool, instead deploying it as a simple place-holder to ensure customers are at least given some information while they wait. However, a study of 3,630 UK businesses by PH Media Group discovered veterinary surgeries leave customers on hold for an average of 39.44 seconds per call, longer than the national average of 33.48 seconds.

To compound the issue, further research has found that 50 per cent of callers will hang up within 20 seconds when faced with silence, highlighting the fact there is a problem of which vets possibly remain unaware.

Creating a lasting impression

First impressions are important when it comes to building – and maintaining – a client base, with visual branding being high on the marketing agenda. But telephone presence can be one of the largest determining factors in shaping perceptions of a company, with many customers developing a lasting opinion based on how they are dealt with on the phone.

Inbound calls are key to a practice's success. Whether it is an existing client ringing to make an appointment or enquire about additional services, or a potential customer looking for a suitable vet, a best-practice approach to call handling is crucial.

By handling calls and queries in a professional way, it is possible to enhance customer experience; but when a customer needs extra information that isn't to hand or has to be transferred to another member of staff, leaving them to wait on the line is unavoidable. In these cases, employing 'on-hold' marketing can actually turn previously 'dead time' to a surgery's advantage.

Get the message

'On-hold' marketing offers an ideal chance for highly-targeted advertising conducted in a completely unobtrusive manner. For example, early summer messages may remind callers to de-flea their pets and messages in the run up to Bonfire Night could suggest products to help calm cats and dogs when the fireworks start.

It can also serve a dual purpose as a tool to aid the cross-selling and up-selling of products and services, and a way to improve service by providing customers with highly relevant information and advice.

Given the emergency nature of many calls, it is important to prioritise; but this can easily be done by implementing an interactive voice response (IVR) system that invites callers to press a certain number depending on their needs. Emergencies can then be dealt with quickly, while other customers hold briefly but are kept entertained and engaged by informative messages accompanied by appropriate music.

Emotional power of sound

The research also found that 34 per cent of callers placed on hold by vets were subjected to

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MARKETING

silence. A further 26 per cent were made to listen to music, while 26 per cent heard beeps. So there is clearly room for improvement.

When faced with any of the above, customers will not be receiving the personal, friendly, empathic service that is a hallmark of good veterinary practices. On the other hand, those who deploy tailored messaging can tap into the emotional power of sound in order to strengthen brand reputation.

Hearing is one of our most powerful emotional senses. The sounds we hear on a daily basis have the ability to provoke strong feelings within us. As a practical example, many couples will refer to a particular piece of music as "our song" and it will immediately spark the recall of happy memories and positive emotions.

Equally, the use of inappropriate voice or music by a veterinary surgery could communicate the wrong image, creating a perception in the customer's mind that becomes difficult to shake. Therefore, careful selection of an 'audio brand' that is congruent with visual branding makes it possible to reinforce company values, create a positive impression and provide a subtle sell on products and services.

Selecting an audio brand

The term 'audio branding' is one usually associated with multinational 'megabrands' rather than SMEs, conjuring thoughts of Intel's advertising jingle or the various sounds used by Microsoft across its suite of products. However, audio branding has applications across the board and can be used in a more practical sense by vets as part of their efforts to present their business in the best possible light.

Initially, the process of developing an audio brand can seem daunting, as there are a number of variables to consider. For example, the voice could be male or female, young or old, using an accent or received pronunciation. Even the tone of voice, or the speed and style of the music tracks used, will play a role in influencing a customer's thoughts and feelings.

Ultimately, it boils down to the kind of brand image each of these attributes communicates. So the process of choosing voice and music should start by considering what existing branding says about the company and working forwards, rather than choosing voice and music, and then trying to make it fit.

Talk to clients in a language they understand

Veterinary practices will usually strive to portray a friendly yet professional and knowledgeable image. Clients want to know they will receive a personal service yet also need to be able to trust a vet to look after their beloved pets.

> "The use of inappropriate voice or music by a veterinary surgery can communicate the wrong message"

In this context, it is perhaps unsurprising that the profile of the most common voice used in the profession is female and aged between 30 and 45. A feminine voice is typically perceived as soft, soothing and welcoming, thereby offering a good fit in an industry where the right welcome is crucial.

By choosing a slightly older voice over a young one, businesses also ensure that professionalism and dependability shine through. It provides customers with the reassurance the vet will have the requisite knowledge and experience to do the best job possible. A masculine voice has its pros too, particularly as it can also be used to convey a sense of authority; so it is simply a matter of which suits your business best.

The customer base is a consideration too. If it is predominantly female, they may react better to a feminine voice and develop a belief they are being spoken to by someone who understands their needs.

Sense of place

Gone are the days when the media and advertising were dominated by voices speaking in received pronunciation and a number of high profile advertising campaigns – such as Sean Bean's work for O2 – have made accents far more acceptable.

Currently, around 40 per cent of businesses use an accent in their 'on-hold' marketing, or incorporate dialect into their marketing communications. For businesses operating in areas with a particularly strong sense of identity, this can be crucial. A sense of place can sway a customer to choose one business over another, owing to a feeling of being better understood.

Perceptions are also attached to particular accents. For example, Mancunians are seen as industrious and creative – maybe a throwback to the city's prominent role in the industrial revolution – and Geordie accents are perceived as being friendly, approachable and genuine.

Make sweet music

Voice does not work in isolation, however, and must be combined with the right music in order to have the biggest possible effect. Often, a business will simply choose a popular music track to play in store or on its phone line, believing this represents the best way to keep customers happy and entertained. Yet popular tracks come with baggage, as people involuntarily attach feelings – both positive and negative – to a piece of commercial music.

Consequently, playing a piece of commercial music in an on-hold situation can be counterproductive, no matter how cheery and upbeat it may seem. Working with the appropriate specialist in order to create new music tracks that are unique to the practice can help shape the 'corporate' image in a positive manner.

Unsurprisingly, the most popular music used by veterinary surgeries is relaxed in style so, when combined with an equally soothing and friendly voice, will help to comfort callers who may be distressed.

Avoiding message fatigue

The right combination of voice and music deployed on the phone line can have a powerful impact on the subconscience of customers. It helps to encourage clients to make a buying decision and research has shown 20 per cent of UK consumers have made a purchase based on information heard while on hold.

However, sound too can induce fatigue if not deployed correctly. When a customer hears the same audio messages every time they call a company, they will reach a point where they simply switch off.

Updating the content of a message is not only imperative to ensure that callers are kept aware of changes to services, opening times or promotions but also to hold their attention.

Conclusion

When used correctly, 'on-hold' marketing can become a key differentiator for a company – something for which all veterinary practices strive. ■

Anne-Marie Svendsen-Aylott
CandMedVet MRCVS

Anne-Marie is an Inspirational Leadership coach and trainer. Her focus is on helping businesses create a culture of change where employee motivation and happiness is in focus. All her training is grounded in research and psychology and provides in-depth skills in communication.

Anne-Marie qualified as a veterinary surgeon, has worked for many years in sales, marketing and training and now runs the company, PurpleCat Coaching.

**Suggested Personal & Professional Development (PPD)*

STRESS

Understanding individual components of stress

A previous commentary in *Veterinary Practice Today* [Summer 2014, 2(2): 6-7] made the point that to combat stress it is important to ensure a culture of well-being in the practice. This article unpacks the components of stress and offers some insightful approaches to its resolution and prevention in practice.

Perception of stress

Stress is experienced when a person feels that 'environmental demands tax or exceed his or her adaptive capacity, resulting in psychological and biological changes that may place him or her at risk for disease' (Lazarus & Folkman, 1984).

In essence, stress is a highly individual feeling that depends on the internal and external resources that an individual has available. The literature talks about 'resilience' or having high 'distress'. A key fact is to recognise that there are both external and internal stressors (things that cause stress) and a person's tolerance to stress is linked to both of these (**Figure 1**).

External and internal causes

External causes of stress are often easy to point out:

- Too many tasks to get done in the space of time available = work overload
- Long work hours
- Lack of sleep
- Lack of exercise
- Physical discomfort – hunger/thirst/pain
- Role conflict – being asked to do a job without the necessary resources available

Internal stressors are far more complicated than external ones, and to fully understand their impact it is important to first look at a hierarchy of how we perceive ourselves. There are a number of 'external' factors that are likely to drive internal stress, so these will be included under the category of 'internal' stressors.

> *It is tempting to ask employees to stay extra time when the practice is busy. Bear in mind that allowing people time to exercise after work and to have enough sleep is directly linked to their resilience and personal resources the next day* (Nägel & Sonnentag, 2013)

Difference between identity and behaviour

As we go through life, we operate by means of a hierarchy of meaning. It starts with the self/the identity and results in the outcomes we get out of life. The hierarchy is represented in **Figure 2**.

Internal causes of stress

One of the primary internal causes of stress is believing that outcomes reflect on your identity rather than on your behaviour. So, for instance, "I didn't call the client and that means that I am a useless nurse/vet" rather than just "I didn't call the client". Similarly, phrases such as, "I am useless!", "I am no good", "I am a rubbish nurse" are not helpful.

Emotional distress often results from the receipt of conflicting messages:

Role conflict – conflicting messages from management that causes insecurities as to what the person is supposed to do.

Value conflicts - (Cable & Judge, 1996; Chao et al, 1994; Cohen & Wills, 1985; Harris & Mossholder, 1996; Lee & Mowday, 1987). The practice may appear to have different values to the person – commonly

Figure 1. *When stress is combined with a feeling of powerlessness, it can lead to depression.*

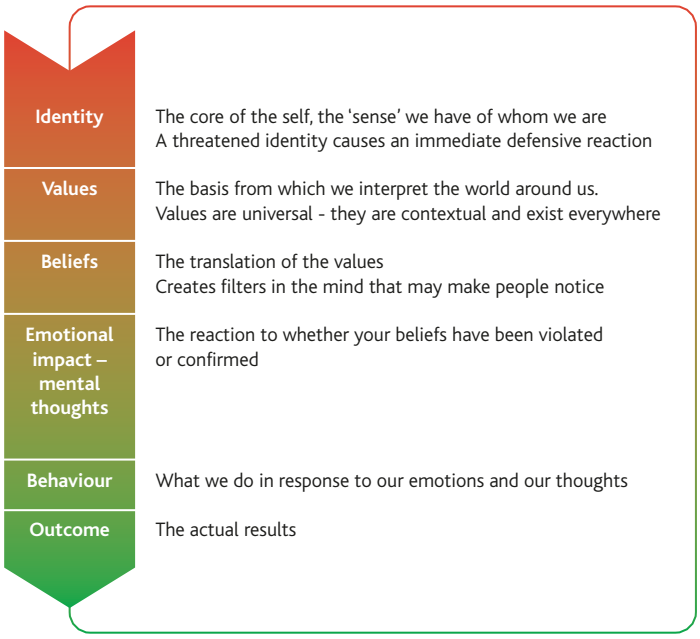

Figure 2. *The hierarchy of meaning.*

Figure 3. *Interacting with the pets is often a key motivational driver for nurses. When work pressures prevent this from happening, stress increases sharply.*

money versus care – or the person finds themselves doing things that are not in alignment with his or her values. This latter is experienced when too high a work pressure means that there is not enough time to care for the pets to the standards that the person wants.

Job insecurity – usually the consequence of the uncertain future of the practice, lack of cohesion in the practice (partners or managers that don't get along!) or the lack of a clearly communicated vision of where the practice is going.

Low job control – is invariably a reflection of poor management. This may be manifested as 'micromanagement', which implies a lack of trust and is the quickest way to get people to check out emotionally, mentally and physically. The other option is when 'management does not listen' – people suggest a beneficial change but nothing happens and no clear reason is given. This is especially detrimental when people feel that their workload is too great and can predispose them to depression (Li et al, 2013).

Own expectations – are strongly tied in with values and beliefs summarised as, 'Everything has to be done perfectly to count as being done properly' and 'People are more important than tasks'.

Lack of intrinsic motivation

There are three universal intrinsic motivators (Reis et al, 2000; Ryan & Deci, 2000)

Autonomy – being allowed to make decisions on your own, getting on with things without close supervision (Reeve, 2009)

Mastery – improving skills, continuous learning (Deci & Ryan, 2000; Gladwell, 2008; Reeve, 2009)

Relationships – spending time with others, engaged in team work (Baumeister & Leary, 1995; Maslow, 1943; Reeve, 2009) (**Figure 3**).

As is obvious from above, stress is a complicated phenomenon that is driven by a range of things. So what can be done in a practice environment to reduce the likelihood of people experiencing stress?

Framework for identity to behaviour

The first thing is to ensure that there is a clear framework in the practice – a framework that reflects the hierarchy from identity to behaviour.

Identity

Who are we as a practice? What are the key points that make us 'us'? Who are our clients who are the people that work here?

Values

What are the key values that drive us? Do they include professionalism, caring, support, money and team work, for instance. It is advisable to focus on a maximum of six values and prioritise them. If as veterinary professionals you cannot agree on the values, you probably shouldn't own a practice together!

Make sure that these values are a key part of any recruitment process. In order for people to thrive in a job, they need to have the same values as the employer (Chatman, 1991).

Beliefs

What do the values mean? For example, does 'professionalism' mean that we have Certificate holders, or does it mean that we always provide the recommendation that is the best for the pet before we work with the client to find a solution that they can afford?

Emotional impact and mental approach

What are the emotions that we want to foster? What is the type of thinking that we are looking for in our people? High on this list should be a positive and 'smiling' atmosphere, and the mental attitude of 'We are all part of the same team'.

Behaviours

How do our values translate into specific behaviours? How do we *know* and *recognise* that we are 'living' our values? Do we always smile and greet each other when we first meet in the mornings, for instance? It is important to recognise

"Stress is a complicated phenomenon that is driven by a range of things"

Figure 4. *The structure and framework that you establish determines everything else. Without framework, people are unsure of what they have. Are we a carrot? Or are we a fungus?*

that values on their own *do not work*! Everyone has different interpretations of what the individual values mean and as you move down the cascade, those differences can translate into a wide range of behaviours – a range that may not be what you are looking for in the practice.

It is vital to have the discipline to think through the whole process and to make it a living, breathing, active thing that you constantly revisit (**Figure 4**).

Leadership and management

Once the framework is in place, you can focus on how to operate within it. Again, there are a number of things that will help you manage the stress of the people in the practice.

Open and honest communication

Consider feeding back to the team how the practice is doing, on a monthly basis. This keeps them in touch with the financial side of things and also gives you the opportunity to acknowledge the extra effort that goes into busy months.

Share ideas and the direction in which your planning is moving – "We are thinking about offering a healthcare scheme", "We are looking at whether we can afford to hire another two nurses" – and then share the reasons that things may or may not pan out that way.

Give regular feedback and *make sure that the feedback is specifically on behaviour.* Feedback on identity should be given with care as phrases such as, "You are lazy/stupid/inconsiderate/rude" can be misconstrued. Anything that starts with "You are..." will be feedback on identity and causes people to feel that it is impossible to change. This has been shown to have a strong impact on health and personal life (Rodwell et al, 2014).

Listen actively, record all the suggestions that people make, and have a transparent process for dealing with them. Feed back to people where you stand on their ideas – for instance, "We are still debating whether it will work" – and let them know the reasons why their suggestion may not be appropriate at this time.

Acknowledge when people say that they have too much to do and take it seriously! Make sure you give back to individuals and teams when they go the extra mile, whether it is through time in lieu or extra "thank you's".

Nurture an 'open mind' culture where the focus is on growing the individual. When you adopt this approach, it becomes OK for people to make the occasional mistake; after all, mistakes are just one way that we learn. It is important too to enable intrinsic motivation.

A clear framework gives you the security that your teams know exactly what behaviours are appropriate in any given situation – and that they can make the judgements for themselves.

Providing ongoing CPD and career progression is a key motivator as is provision during a busy day for people to catch up with each other.

Understand that someone standing around and having a chat is not necessarily 'lazing about' – it is driving motivation for the rest of the day.

Finally, as part of your framework, make it clear what the priorities are and what may be pushed aside once in a while. Set clear expectations of what behaviours you expect to see and encourage anything that is positive.

Set the standards by personal example and communicate proactively that no one is perfect and that it is OK to 'have a moment'. Something that can really help the people in the practice to work on their stress levels is for you to work on yours.

"Give regular feedback and make sure that the feedback is specifically on behaviour"

Summary

We all have a responsibility to grow our personal and emotional skills – and thereby – our resilience. To help you with this, we shall provide a series of articles in the next few issues of *Veterinary Practice Today* to give you the tools on how to reduce stress and increase your personal happiness. ■

PPD Questions

1. What are some of the external causes of stress?
2. What is the order of the hierarchy of meaning?
3. What are the three universal intrinsic motivators?
4. You come into work and your nurses are standing in a group talking rather than being busy with the chores for the day. What do you need to remember?
5. What is the key thing that needs to be in place in order for a practice to be able to reduce stress?

Answers

1. Long work hours, lack of sleep, role conflict and work overload
2. Identity, value, belief, emotional reaction, behaviour and outcome
3. Autonomy, mastery and relationships
4. That people are driven by intrinsic motivators and maintaining relationships improves their overall work performance
5. Establish a framework that describes the practice from identity, over values, to how those values are interpreted (beliefs). Specify what you would like people to think and feel in the practice and clearly identify the specific, detailed behaviours that will drive your ideal outcome

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Anne-Marie Breach

After completing the National Council for the Training of Journalists one-year course, Anne-Marie started work as a reporter and progressed to become group editor of the Anglia Advertiser Series of free newspapers. She was a founder member of the team that set up The Beach radio station in Lowestoft & Great Yarmouth before becoming a press officer with Suffolk Constabulary in 2001 and, subsequently Media & Marketing Co-ordinator at Vision Media.

**Suggested Personal & Professional Development (PPD)*

PRESS RELEASES

Writing a press release

Gaining publicity for your practice can be easier than you think.

The media generally love stories involving animals as they know these will attract attention, particularly if accompanied by a suitable photograph – so you can boost your chances of gaining positive publicity simply by providing good quality images and information.

As with many other commercial sectors, the media have had to make cuts during the recession, leaving hard-pressed reporters looking for interesting pieces and articles that can be used to fill a space. This means that you stand a good chance of being able to get something into your local paper or in other media – it's just a case of making it happen.

This doesn't have to mean a great deal of work yet can result in free advertising for your services, provide a professional and friendly view of your practice and potentially attract new clients.

Choosing what to publicise

There are a number of things you may want to think about publicising. It could be an event you have planned, a charity collection, a special offer, a good story about an interesting case, a rescue or an outcome against the odds.

Some stories are likely to require the pre-publication consent of the pet owner; but think about broaching the subject if something has gone particularly well, if the client is extremely pleased with the service, or if a member of your team has done an especially good job.

> "Begin by thinking of your story in one sentence"

When you're writing a press release, think about how you would explain it to a 12-year-old

As with many things, preparation is the key. Have a clear idea of what you want to publicise – and then get it written up in press release form so you can email it out as required.

Writing your press release

Always put the most important information first. Think of your story in one sentence to start with – for example, 'We want to attract people to our open day'/ 'We've saved an animal found abandoned'/ 'We're collecting pet food to be donated to charity'/ 'A pet is ready to go home after undergoing complex or unusual treatment or surgery' – and use this as the basis for your first paragraph.

Keep this first paragraph fairly short – around 20 words if you can, under 30 words if at all possible. Keep it brief, straightforward and interesting.

Use the second and third paragraphs to give the next most important information. In the case of an event, this will be things like date, time, attractions and what's going on; while if it's a tale of rescue it will be the who, what, where, when, how and why it happened.

When you're writing it, think about how you would explain it to a 12-year-old – this really is the level at which you need to pitch your release because it needs to be accessible and understandable by all.

Hints and tips

Always use full names and give titles where appropriate. If you




Press releases can help you gain publicity for events such as open days

are using the name of a pet and owner, for example, 'Tiddles, owned by Bobbie Smith', it helps the reporter if at some point you mention whether Bobbie is a Mr, Mrs, Miss, Ms, Dr, and so on, and whether Tiddles is male or female.

The media are far more likely to use your story if you do a lot of the work for them – so include a quote or two from yourself and/or a relevant owner/staff member, and at least one good quality photograph. Sending two or three well-chosen, captioned images gives them a choice of which to use – and there is no need to send more.

Make sure you also include contact information. This should take two forms: one that can be given out to the public – for more details for anyone interested to get in touch – which should be fairly generic (your main enquiry phone number and email, for example), and one for reporters to come back to you on if they need anything else – not for publication, but which can be more personal. Ensure you make the distinction between the two.

Sending your story to the media

The next step is to gather the names of appropriate media contacts. You may already have some; but if not, take a look at the local papers which will contain names and relevant phone numbers/email addresses; or listen to a local radio station and note who is reading the news or ring the news desk direct and have a quick chat with someone.

> "The media are far more likely to use your story if you do a lot of work for them"

Sometimes, if you have a good or time-sensitive story, the journalists may want to make arrangements to come out and see you. However, more often – and particularly if the reporter is busy – you can tell them a piece is on the way and check the right email address to which to send your press release and photos.

More guidance

Beware of approaching the media on their 'deadline day' – you may get cut off before you even start. Many local weekly papers that publish on a Thursday or Friday may have a particularly busy Monday to Wednesday. So, if you can, try having your 'ducks in a row' in good time and call journalists on a Monday or preceding Friday – you may well receive a more positive response. Try calling radio stations away from news bulletin times (usually on the hour).

If you have an event coming up to which you wish to attract people, think of it as a three-pronged attack – one piece well in advance (up to a month before to let people know it's going to be happening), one a fortnight to a week beforehand, and a piece afterwards, with a photograph.

You may be asked to tie in an article with advertising in the publication. This can be of mutual benefit if you have the budget and inclination to do so; but it is not compulsory, and if your story is of sufficient interest, it will probably be published regardless. ■

Are we prepared for change?

Work-life balance, disillusionment and maintaining standards were highlighted as being the issues of most concern in a rapidly changing profession, at last year's British Veterinary Association (BVA) Congress.

"Our profession is facing enormous change," said Adi Nell, a senior partner at Medivet, as he opened a panel session on the future of veterinary practice in November. "Not only is that change very wide ranging, but it is happening at a rapid pace."

Five issues were identified as generating the most discussion, interest and anxiety among members of the profession. They were:

- How to acquire the business skills and knowledge needed to run a business
- Corporate practices and their impact on individual vets and the profession as a whole
- How to grow the market and protect veterinary work
- Improving work-life balance
- How to maintain standards and support for a rising number of veterinary students and new graduates

When asked to vote on the issue about which they felt most strongly, delegates identified work-life balance to be one of the most significant. Expectations of work-life balance have changed and more and more vets want greater equilibrium. With an ever-increasing number of female vets entering the profession and taking career breaks to raise a family, Mr Nell asked: "How do we deal with that as a profession? What challenges does it present?"

Recent RVC graduate, Myfanwy Hill, who sat on a panel of six, argued that gender is not the issue. "We need to take gender out of the equation and look at the underlying problems here. Really that is to do with how we offer flexibility."

Sitting on the panel alongside Ms Hill were: RCVS president, Stuart Reid; BVA president, John Blackwell; Penny Watson from Cambridge Veterinary School; editor of the *Veterinary Record* and *In Practice*, Martin Alder; group operations director for Companion Care, Mark Welch.

The problem is not specific to the veterinary profession, suggested Mr Alder. Work-life balance has been a concern for women in academia for some time. He questioned whether it is too difficult for female veterinary surgeons to return to the profession after a career break. "If that's actually the case, I think the nature of practice really does have to change," he said. "I think we have to get used to the fact that practice structure and working methods are going to change over the years".

Delegates also felt particularly strongly about the issue of maintaining standards; and discussions on this subject were closely linked with those relating to work-life balance. Mr Welch said in order to maintain standards, we must address the issues associated with poor work-life balance. The average period of time vets stay in their first job after graduating is 15 months, calling into question whether this is the consequence of a lack of support or flexibility from employers.

Mr Reid asked the thought-provoking question: "How attractive is the profession?" According to a recent survey, 43 per cent of responding vets said they wish they had chosen a different career, though it is not known how representative these findings are. Mr Reid said: "If the 43 per cent is accurate, we clearly have an issue."

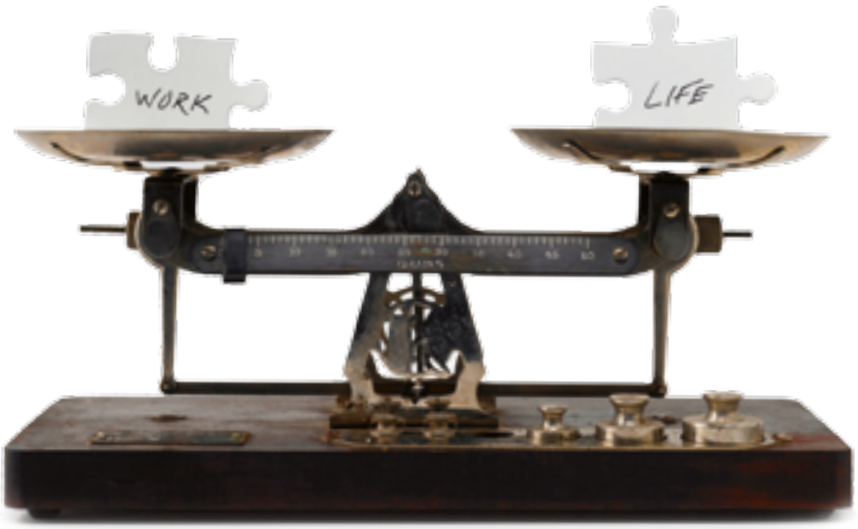
Discussions led on to why vets leave the profession – whether it is to start a family, to go into a non-clinical role or whether they become disillusioned with the work.

Penny Watson said that she admits and recruits students to Cambridge Vet School who are "very driven to be vets", but when they graduate "something happens to disillusion them". While she says there is no simple answer, lack of support and flexibility is part of the problem. "I don't think we're admitting kids (sic) who don't want to work long hours and don't love the job, we're just letting them down when they get out there."

Client attitudes are another important factor, according to past BVA president, Robin Hargreaves, who defended veterinary employers. "I think there's a grave danger that we assume because people are disappointed with practice that employers are responsible." Positive feedback from clients is increasingly rare, which he said is "very wearing" for vets. "When we're successful, we've simply done what we're paid for; when we're unsuccessful, we've let them down."

To some extent, the problem begins at veterinary school, Ms Hill added. With huge demands on prospective students, and long working hours when they get on to the course, their other interests outside of veterinary studies are being stifled. It is difficult to then regain these hobbies and interests later on, which contributes to a poor work-life balance.

Delegates were asked to vote on the extent to which practices will need to adapt to part-time working too. On the whole, responses leaned towards this becoming the norm in future, but when asked how ready they felt for the change, they were divided. ■



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Industry Profile

Your name: David Ellerton
Position: Chairman of the National Office of Animal Health (NOAH)
Company: NOAH represents the UK animal medicine industry and aims to promote the benefits of safe, effective quality medicines to promote the health and welfare of all animals

What do you do?
As its chairman, I lead the NOAH Board which sets our priorities and is responsible for the development and implementation of our overall strategy. I also oversee the governance of NOAH, working with its executive team. I am managing director of the veterinary pharmaceutical company, Virbac UK and Ireland, where I have ultimate responsibility for the business and am heavily involved in defining the firm's European strategy.

You first became involved with NOAH 20 years ago on its Companion Animal Sub-Committee. Did you then envisage being its chairman one day? And how does it now feel to be in that position?
Absolutely not! In those days, our sub-committee reported into a bigger committee which, in turn, reported into the board. It was a much bigger organisation with the people at the top remote and virtually unknown. While I was ambitious, achieving higher office at NOAH never crossed my mind. As my career developed, however, my involvement with NOAH also increased. I joined the Public Affairs Committee in 1998 and was later the NOAH-appointed director to the Animal Medicines Training & Regulatory Authority (AMTRA).

I feel a great responsibility for shaping NOAH's future, ensuring it remains fit for purpose during a time of huge change in our industry and the wider world. It is in everyone's interest that it is in a strong position to meet the needs of its members and to face the challenges ahead – and to this end, I'm working hard with my colleagues on the NOAH Board.

What does your experience within the veterinary industry bring to NOAH?
My 30 years' experience in animal health has given me a strong understanding of the dynamics of our industry. I also have strong relationships with many individuals across the sector, many of whom I've worked with over the years. I hope my business experience equips me to be a true chairman who can see both sides of every situation while remaining focused on leading NOAH to the benefit of its members.

NOAH's mission is to promote the benefits of safe, effective, quality medicines for the health and welfare of all animals. In what way should it influence the antimicrobial resistance debate?
Antimicrobials are vital for the health and welfare of all animals – farm livestock and pets. Sometimes this gets lost in the debate. Because animals need to be treated, vets should be able to choose the most appropriate antibiotic to combat the infection in animals that require them.

While it is acknowledged by the UK Department of Health that the primary cause of resistance problems in human medicines is through human medical use, it does not mean that we should sit back; so we are working with other organisations – including the veterinary profession, through Responsible Use of Medicines in Agriculture (RUMA) – to promote the responsible use of antibiotics. RUMA has an action plan to implement the Department of Health's five-year strategy on resistance, which we, along with the other RUMA members, support.

We are also working to educate decision-makers that responsible prescribing and use – together with enhanced monitoring and surveillance – is the best way to help preserve antibiotics to protect people and animals, rather than restricting their availability through the use of arbitrary, non-scientific volume reduction targets.

What real influence do you feel NOAH has politically? Could/ should it have a stronger voice?
NOAH does have a political voice and we are known for our work in promoting the value of companion animals to society and the fact they need to be healthy to fulfil this role.

In Europe, we are actively involved in the European Federation of Animal Health IFAH-Europe, and much of our political effort is focused on the recent publication of the draft legislative package reviewing the controls on the authorisation and marketing of veterinary medicines.

There is work to be done here too, talking to those representing the UK on the European Council and our MEPs. Our objective is to ensure that vets, SQPs and farmers retain access to a range of medicines to maintain animal health and welfare. We also want to see improvements and regulatory efficiencies to ensure that companies continue to develop new and innovative products for animals.

> "Antimicrobials are vital for the health and welfare of all animals – farm livestock and pets. Sometimes this gets lost in the debate"

Sometimes some of the positive messages we give about animal health are not as 'sexy' as those from bodies seeking to scaremonger and so are not picked up as readily by some of the popular press. We have work to do here – but, importantly, our voice is heard by our key stakeholders. Without access to veterinary medicines, farm and companion animal health and welfare would inevitably suffer.

Please will you comment on NOAH's educational role and how you see that developing in the future?
Our role in education is already strong and will become important in the future.

We are proud of the NOAH Certificate of Animal Health (NCAH) for those involved in selling animal medicines. It gives candidates a thorough grounding in animal physiology, animal disease and treatment options, as well as offering them a full knowledge of the legal framework in which medicines are regulated, advertised and sold. It is academically accredited by Harper Adams University. We are working to highlight to our customers the high level of this qualification and the knowledge our members' staff possess. They are an asset to the profession!

We run the Code of Practice for the Promotion of Animal Medicines and hold regular seminars for members to keep them up to date. We are also involved with a 'training the trainer' initiative, alongside the British Cattle Veterinary Association and RUMA for cattle vets, and we are a member of Farming and Countryside Education (FACE).

"The *NOAH Compendium of Data* Sheets is the most widely read text for medicine information"

What do you consider the biggest successes in terms of animal health and welfare achieved by NOAH?
The *NOAH Compendium of Data Sheets* is the most widely read text for medicine information. The hard copy edition is given free of charge to every veterinary practice premises and a specially commissioned edition is produced for AMTRA and provided to SQPs. The free-to-access online version has had more than 225 million visitors since its launch in 2005 with, at present, more than 3,000 visitors and 17,000 page views per day.

It gives prescribers and users of our members' products up-to-date information about animal medicines to aid correct prescribing and responsible use. We are proud of its success in supporting animal health and welfare.

We have also been successful in our education work to promote an overall increase in animal health. Market data show that overall numbers of treatments are rising and that preventive health programmes, in particular, are on the increase.

In what ways does NOAH support its members now and in the future?
We aim to create a climate in which their businesses can thrive – through better regulation and through addressing myths and misconceptions about animal medicines. At a practical level, we also offer information on issues affecting our members' businesses, providing a forum in which they can discuss topics such as draft regulation and a mouthpiece for the whole sector.

As a Board, however, we also recognise that, as business and our industry change, we should adapt our member support services to reflect this. We are exploring ways to do this and will be discussing our ideas with members in the months ahead.

How can the veterinary profession, in conjunction with NOAH, help to improve animal welfare in the UK?
We can do this by working together to promote responsible pet ownership in line with the Five Welfare Needs. Our website pethealthinfo.org.uk for example, gives unbranded advice and encourages owners to seek expert guidance from their vet. To engage effectively with today's pet owners, both industry and veterinary staff must harness new communications technologies – social media and augmented reality being two examples. Times are changing – and so must we!

With the ever-increasing cost of research into new veterinary medicine development, how do you see the future for new medicines and what can be done to help bring new veterinary actives to the market?
We are working to secure a European market for animal medicines with the new draft European regulation – things such as enhanced data protection will help encourage innovation and will not only help bring new active ingredients to market, but also improve formulations and enhance authorised claims, such as indications and species.

It takes many years and a considerable investment to develop a new animal medicine, so companies want to know that any marketing authorisation application will be reviewed scientifically and that goal posts for approval do not change while it is in development. The cost of maintaining a medicine on the market is also high. If it could be reduced, more funds could be directed towards innovation.

There are calls for new antibiotic classes to be developed for veterinary medicine; but this is unlikely to happen because of the imbalance between regulatory hurdles and return on investment in the current climate. This makes the development of new antibiotics difficult when prioritising company R&D programmes.

What are the biggest challenges/opportunities facing NOAH over the coming years and how will you address them?
In terms of challenges, perhaps the greatest is that we need to keep our members motivated and supportive, particularly in these changing times for our industry. They need to know we give them a voice and influence which they would not have as a single company.

In terms of opportunities, the draft European regulation offers the potential to increase innovation, and the fact that all animals need medicines to keep them healthy is perhaps the greatest opportunity of all.

What do you see as the biggest challenges facing UK vets and in what way can NOAH help them overcome them?
The veterinary profession is well respected but, in common with every other profession, faces increased scrutiny today. Vets also face increased competition which requires them to work harder to attract and retain the loyal clients they need to succeed as a business.

We are building on our website to make it even more useful and planning new projects, including a *Compendium* App. We are also exploring how new technologies – such as Blippar, an augmented reality platform – can support vets post-prescribing with responsible use and compliance back-up material. Our website pethealthinfo.org.uk continues to signpost owners back to their vet. ■

Ipswich Veterinary Centre

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The ideal candidates would be veterinary surgeons with significant experience in first opinion practice and have a keen interest in any of the specialisms listed above. Successful candidates will also be excellent communicators with an interest in tutoring and mentoring new and recent graduates. Holding a Certificate or Diploma would be an advantage but is not essential. We will be able to provide flexible working and accommodate a range of full, part-time and shared working arrangements.

For further information, or to apply, please email Denise Wright:
enquiries@ipswichvetcentre.co.uk

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email **lynn.smith@stowevets.co.uk**
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